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vol 13 # 154

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October 1959

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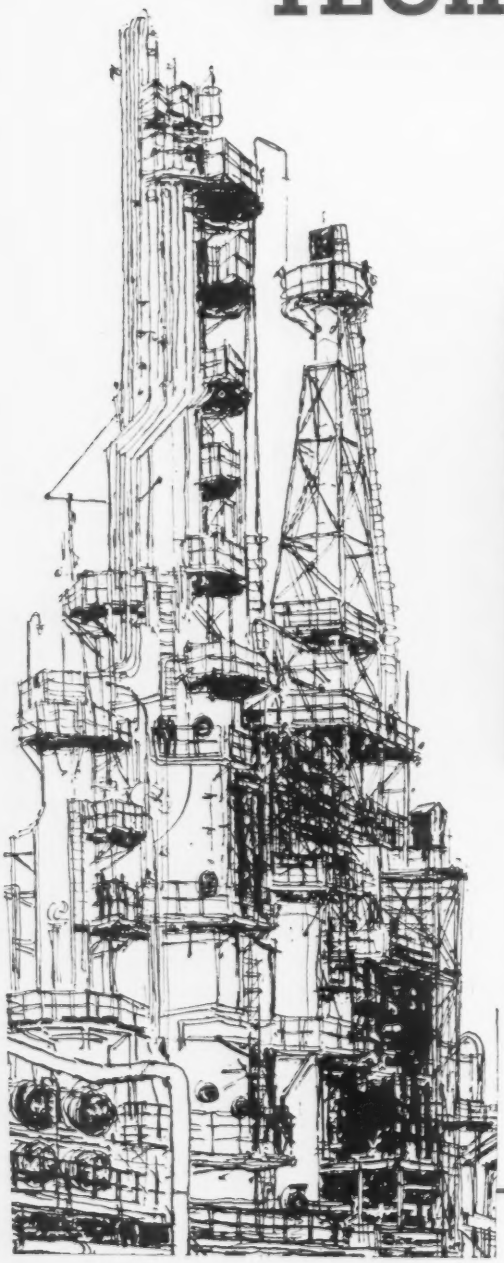

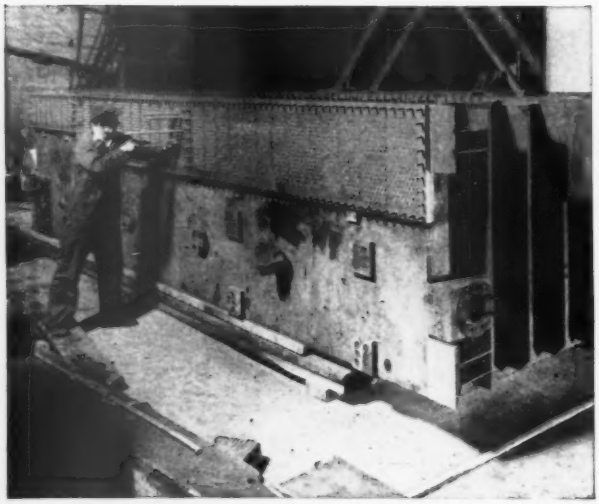

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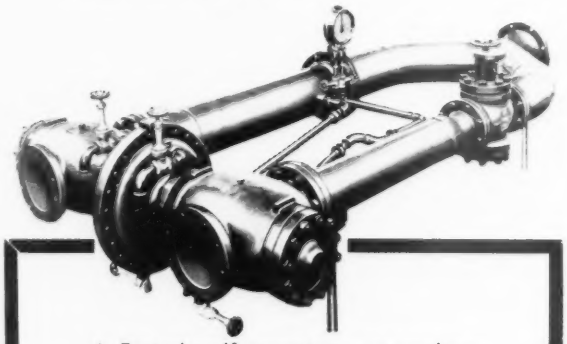

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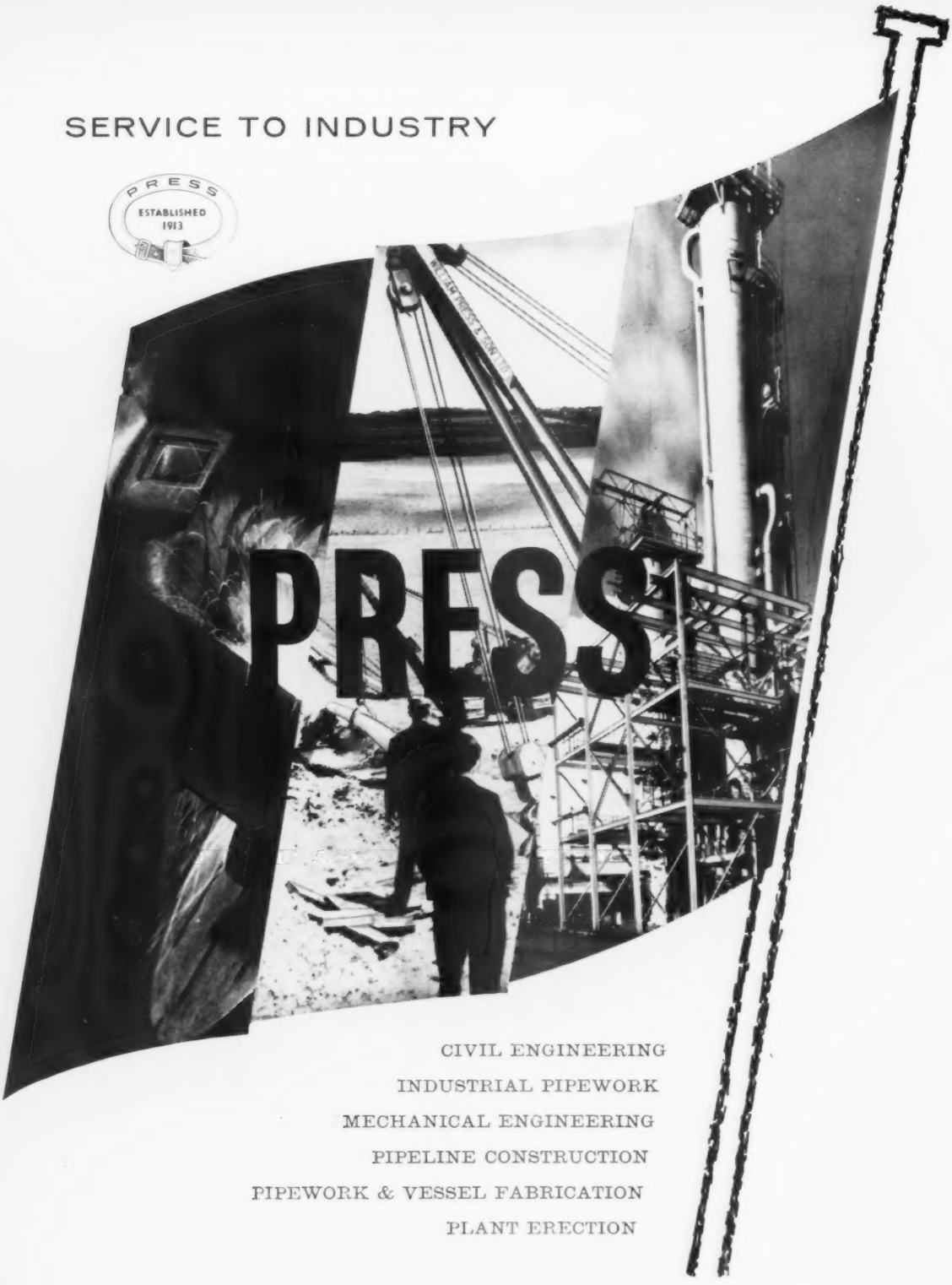

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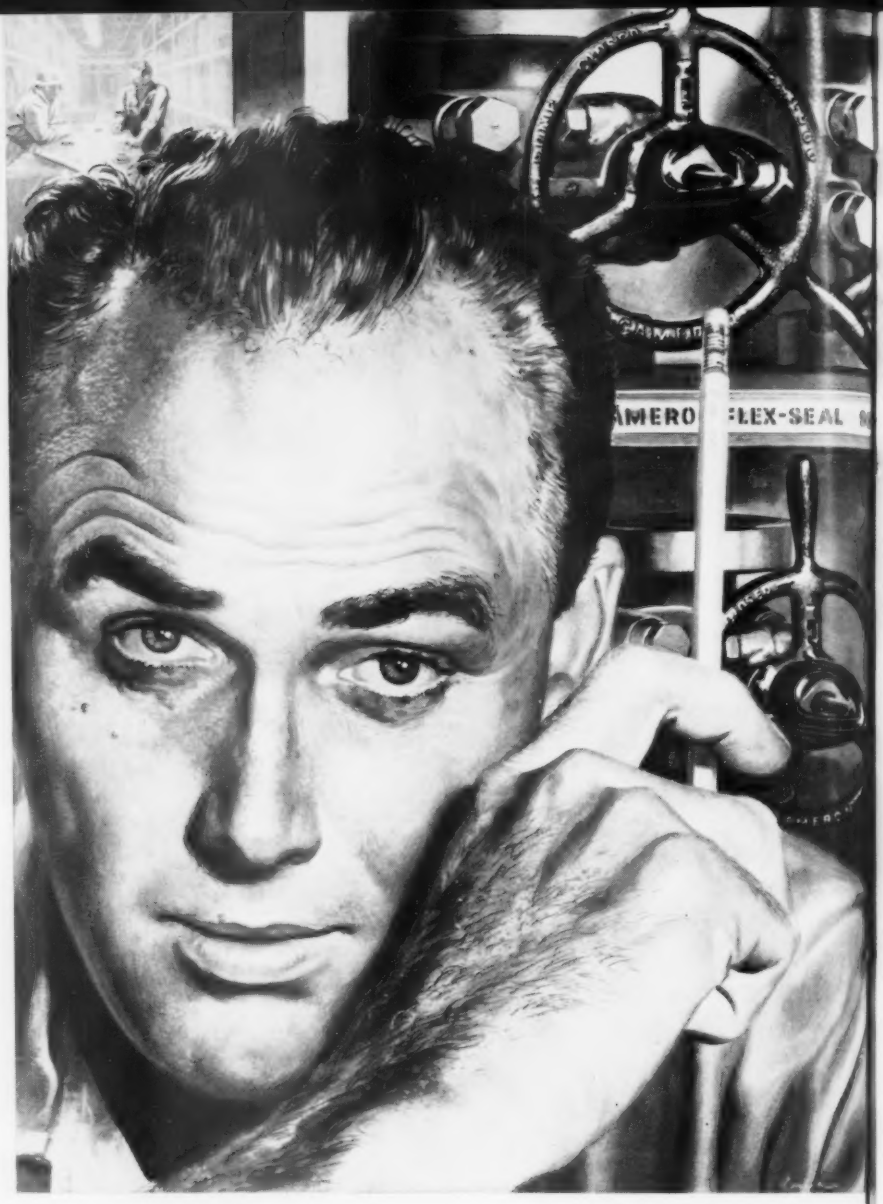

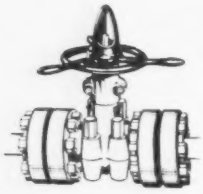

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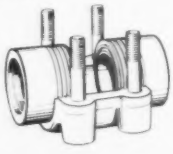

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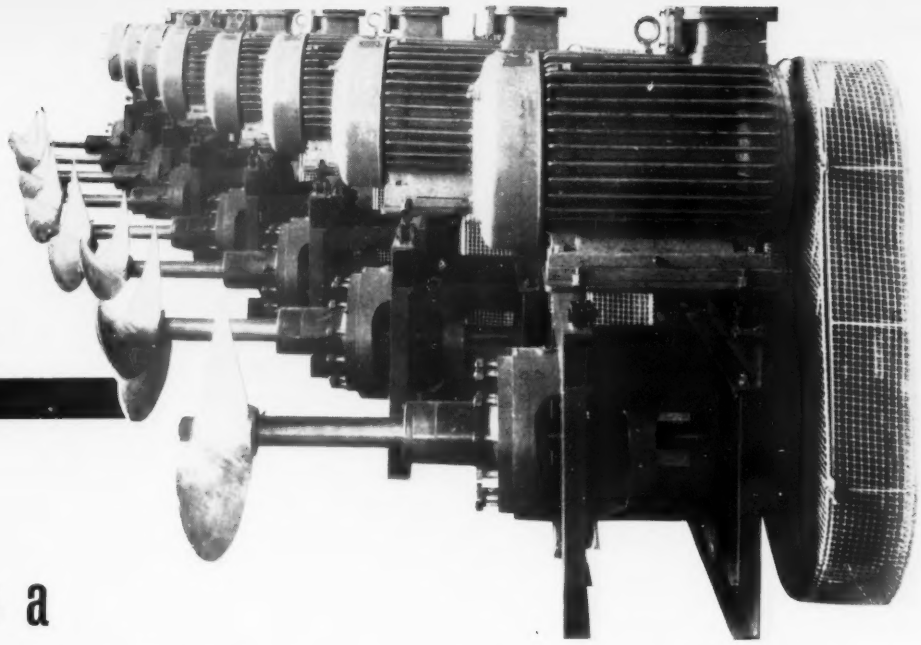

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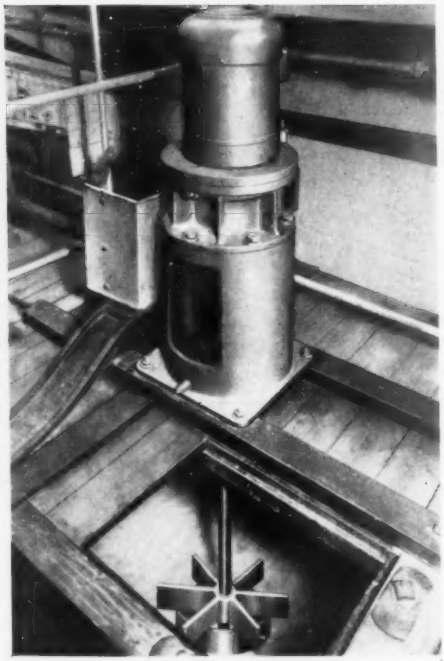

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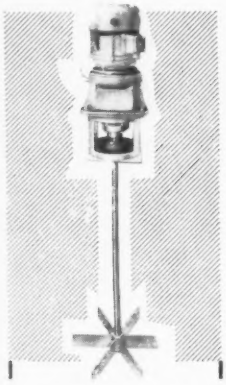
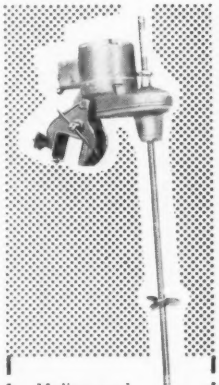
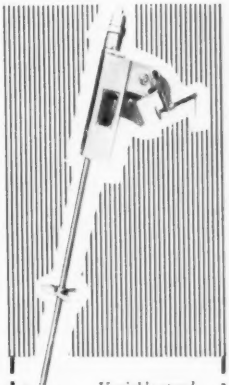


Heavy duty 460 r.p.m. permanently mounted fluid mixer with turbine impeller.



Medium speed agitator, propeller type for oils and grease blending.



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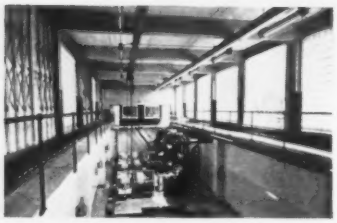
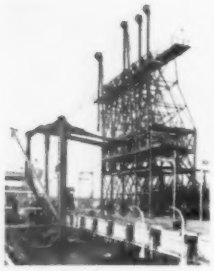


Interior of new electric pump house. Pumps ensures rapid delivery of the heaviest fuel oils.



Manifold pits housing pipe line headers and control valves. (*Above*)

Electrically operated high capacity hose handling equipment discharges up to 3,000 tons an hour. (*Left*)

One of the two new jetties built specially to accommodate tankers up to 65,000 tons.

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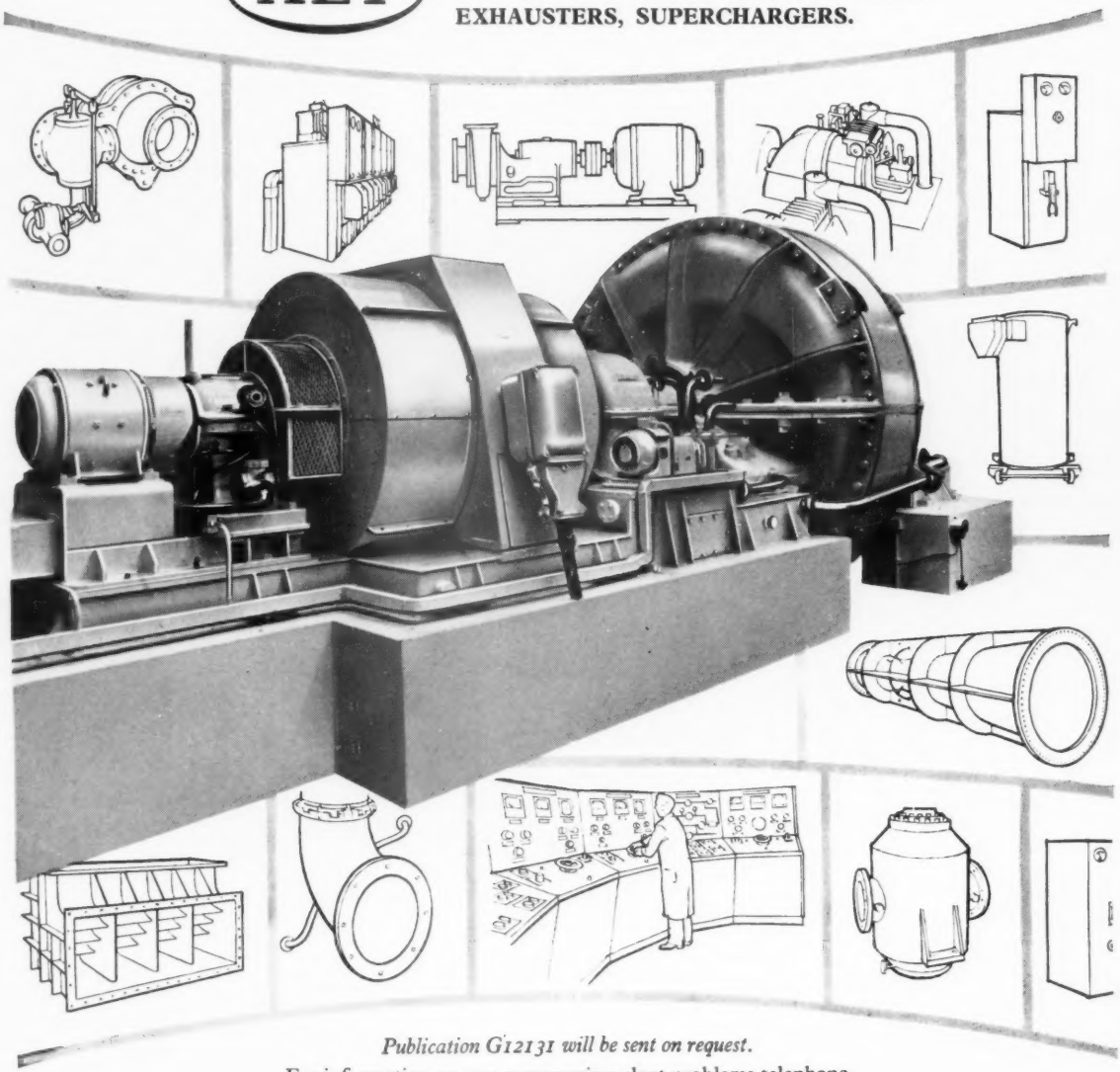

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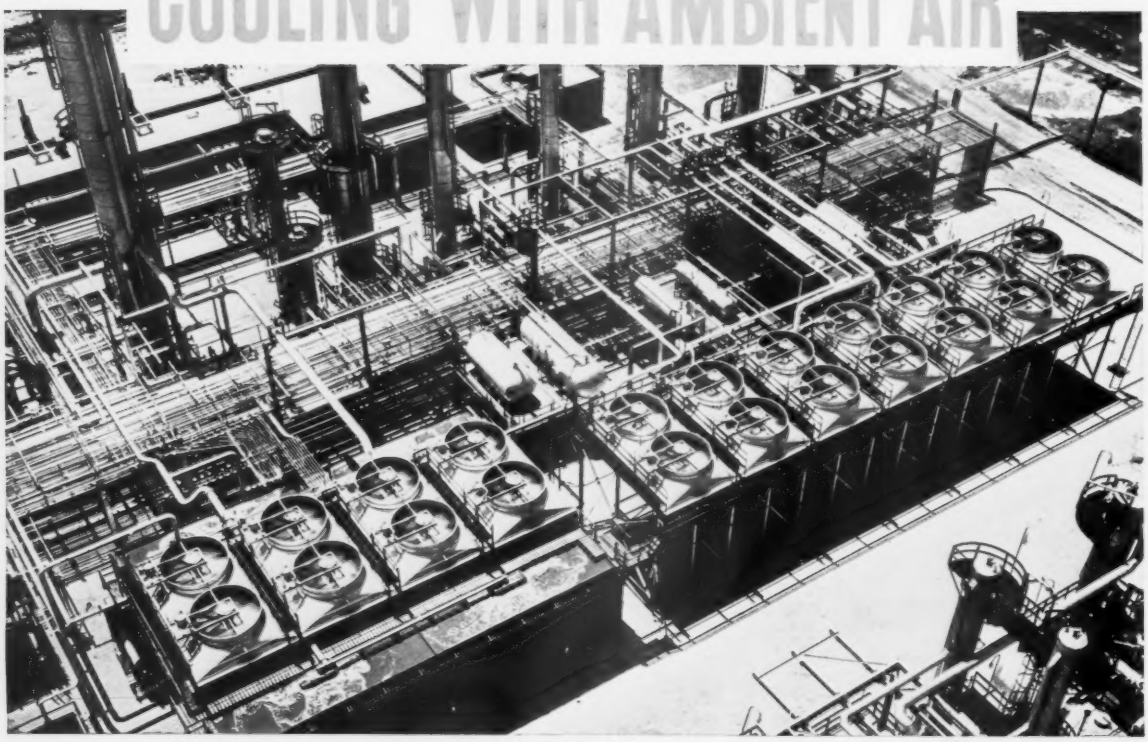

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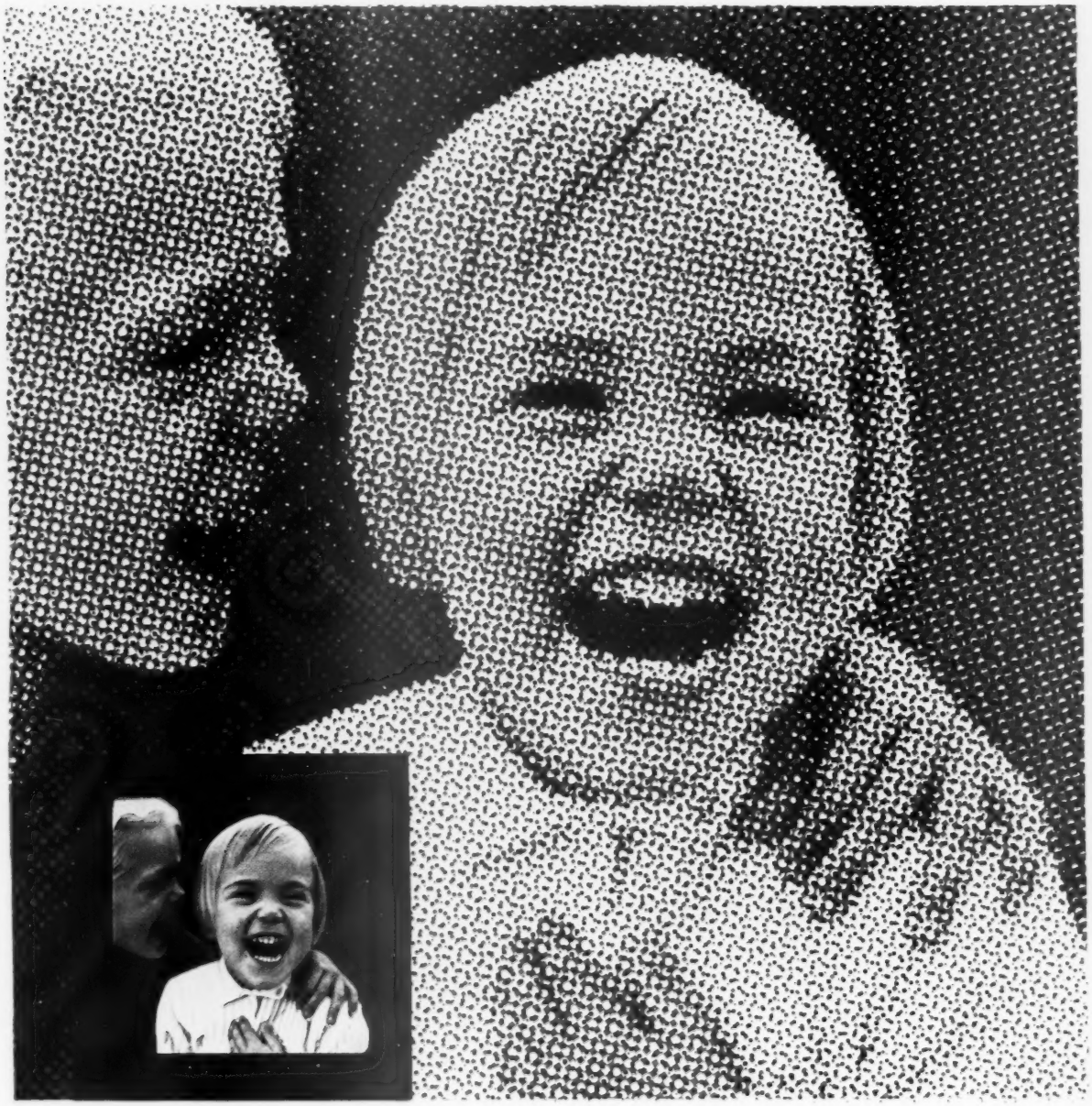

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*Supertanker Construction**

By T. B. HUTCHISON†

The term "supertanker" has been used to describe tankers of about 25,000 tons deadweight and upwards, but size has changed very rapidly over the past ten years and, whereas tankers of 25,000-30,000 tons were the exception, now they are common-place. In fact, today there are ships on order having deadweights in excess of 100,000 tons.

To understand this situation we should really go back many years and consider the earlier tankers which were of ample size and entirely suitable for the trade of their time. Comparatively speaking, some which were built 50 years ago or more were "supertankers" of their day, but the growing demand for petroleum products in countries other than the U.S.A., together with the development of additional sources of supply, such as the Middle East, have made necessary the supertanker of today and those envisaged in the future. Parallel with increasing demand have been improvements in materials and construction techniques which have made these ships possible.

Oil, and possibly even petroleum products, has been carried by ship for a few thousand years. There is a history of Chinese lamp oil carriers and most people will be familiar with details of the ancient wrecks being uncovered in the Mediterranean which carried lamp oil and other scarce liquids in earthenware vessels.

The *Lawhill* was a four-masted barque of about 4400 tons dw, and was one of the earliest regular carriers of case oil. From this type of ship the next step was the construction of the specially designed ship containing the liquid cargo in compartments forming the integral part of the structure.

The st *Gluckauf* was built at Newcastle in 1886 for the German-American Petroleum Co., which was subsequently absorbed into, and now forms part of, Esso Tankschiff, Hamburg. This ship was 300 feet in length and had a deadweight of 2700 tons and was the first of the tankers which we know today; she was also the first to cross the Atlantic with a bulk cargo of oil. Little information is available, but it is interesting to note that the engines were located aft. The size of tankers continued to increase, and in 1903 the *Narrangansett* was built. She was the largest oil tanker then afloat and had a deadweight of 10,500 tons. Propulsion was by triple expansion engines of 5500 ihp, located amidships, with coal-fired boilers giving her a speed of 13 knots.

To meet the increase in demand, and to obtain the most economic unit within the limits of shipbuilding capacity and "know how", a pair of tankships were built in 1907, they were the *Iroquois*, a steamer having a deadweight of 8800 tons, and specially designed for towing, the six-masted barque *Navahoe* of 9250 tons dw. They had a combined average tow speed of about 8·5-9 knots. These ships were operated successfully together until about 1930, and the *Iroquois* continued alone until 1947. This unique combination continued the trend towards operating economy, as exemplified by the specialized supertanker of today with its comparatively high speed and low operating cost, and they were equally successful and met the situation of their times.

Neglecting at the moment the techniques which have made the large ship possible, the justification for stepping-up the size arises from the reduction in operating costs which are achieved by a number of factors. For a 45,000-ton ship, transporation costs per ton carried are about two-thirds that of the familiar T2 type (16,500 tons dw), large numbers of which were built during the war. The rapid reduction in transportation costs from a tanker of this size to the larger ship is gradually reduced until you reach a point where little improvement is obtained. These reductions in transportation costs are primarily due to the fact that the horse-power required to propel a ship at a particular speed does not increase pro rata with size, and consequently, fuel consumption is proportionately less. As an example, the 45,000 ton ship requires only three-fifths of the power per thousand tons that the 16,500 tonner does. There is also a reduction in building cost per dw ton and, consequently, the charges are less, also the crew does not increase in size appreciably. All of these factors contribute to a general reduction in operating costs for the larger size ship. It should be kept in mind, however, that where special operating considerations have to be taken into account, such as the provision of special handling facilities, they may outweigh the economic advantages of the large ship. However, it can be generally said that vessels up to about 75,000 tons, that is, about the largest size of ship which can be satisfactorily propelled on a single screw, show definite economic advantages. If operating speeds of around 17 knots are maintained a further increase in size requires

* Presented to the Fawley Branch on 17 January 1958.

† Manager, C & R Division, Marine Dept, Esso Petroleum Co. Ltd.

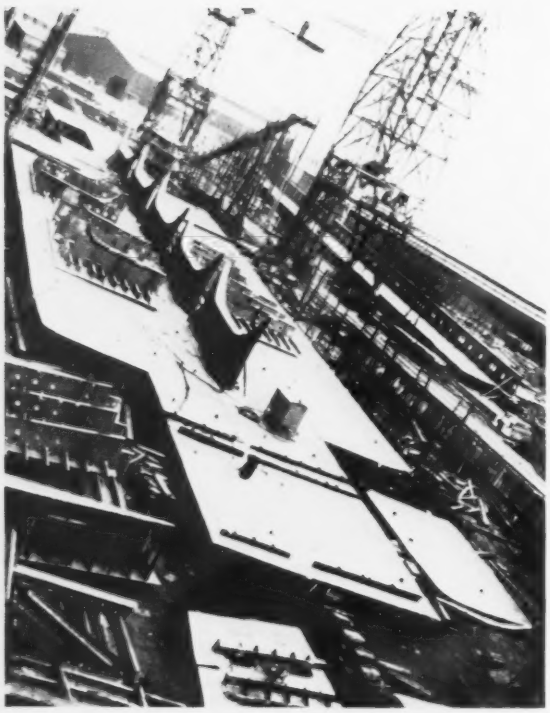


Fig 1. *Bottom plating with centre keel*

twin screws with higher constructional maintenance, and general operating costs. It can therefore be expected that in the future a gap will occur in ship size somewhere between 70,000-100,000 tons dw due to higher operating costs.

In Middle East trade, the Suez Canal has a very large bearing on the economic size of a vessel, as a ship of about 42,000 tons is the largest that can make a fully-loaded passage, but it can be shown that there are advantages in building ships of at least 47,000 tons, and light loading them through the Canal.

In recent years there has been considerable discussion on the size of the largest ship that can pass outward bound through the Canal in ballast, and return from the Persian Gulf round the Cape of Good Hope to Western Europe. It could be envisaged a vessel of about 75,000 tons would come into this category.

The development of the supertanker owes much to the very successful T2's of which about 500 were built during the last war, and to the many lessons which were learned in welding techniques and metallurgy. The T2 itself made no advance in size over tankers already in service, but it was a first example of the prefabricated all-welded ship built in large numbers.

Welding lends itself particularly to shipbuilding, in that it produces a hull which is very clean and smooth as compared with a rivetted ship, thereby affording a reduction in resistance equivalent to an increase in propulsive efficiency of about 3 per cent, this figure varying somewhat with speed. There is also the considerable weight penalty which would have arisen if rivetting had been used for large tankers: on an 18,000-ton ship this could amount to about 600 tons and, although large rivetted tankers have not been built, it could be said that the saving in weight on a 45,000-ton ship due to the use of welding might be something in the region of 1200 tons. Whether large rivetted tankers could have been built is rather doubtful as the problems associated with rivetting would have been very considerable, and a practical arrangement may not have been possible.

With the earlier welded ships, experience was gained in formulating proper welding sequences, and failures which had occurred due to faulty techniques or unsuitable materials, have been largely overcome. In regard to the latter, this has been done by the use of special steels having controlled carbon and manganese contents which offer a greater degree of notch toughness. For large tankers the classification society's, such as Lloyd's, have specified the use of these materials for the highly stressed areas such as the deck, the bottom, the bilge, and the sheerstrake plating over the amidship half-length of the ship.

When an owner makes a decision as to the size of ship in dw tons which he requires, and presumably this decision has been reached after studies have been made into the operational costs based on estimates which have been given on ship cost, etc. the designer is then free to proceed with his work. First of all he will make an estimate of the weight of the ship which will in turn determine its displacement; he will next make studies into its trimming conditions when loaded and in ballast. The basic features of the hull structure will be determined by the preparation of a midship section drawing, the profile and deck drawings following. The strength of the ship will be based upon the freeboard rules set down by statutory decree and many estimates will be made of the stresses to be expected under varying conditions of loading or in ballast. There are many other details which require investigation, such as the estimated resistance, the power required over a range of speed, the cargo pumping performance, type of machinery to be used and its expected performance over the designed operational range of the ship, the electrical circuits, and the layout of the ship's compartments.

The general arrangement and layout of a 36,000-tons dw 16,000 shp 16½-knot service speed supertanker is as follows, and is typical for most vessels of this type. Starting from

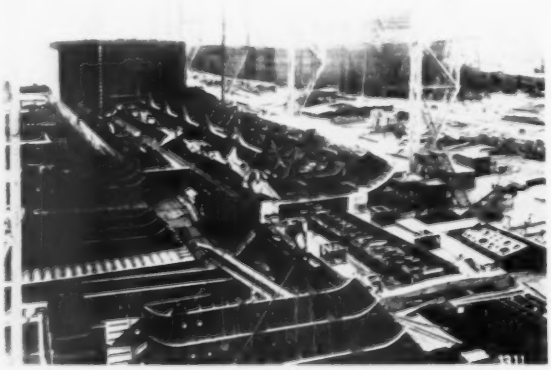


Fig 2. *Bottom plating complete with longitudinals and transverse webs. Some cargo tank bulkheads and shell panels erected*

forward, we have the forepeak tank for water ballast, bounded on the aft side by the collision bulkhead. Next, the forward deep tanks which take either water ballast or oil fuel. The pumps for these tanks are housed in the forward pumproom which forms part of the forward cofferdam to the cargo tanks. Above these forward tanks are the chain locker and various stores and other spaces.

When carrying crude oil as cargo, the cargo tank volume provided is in excess of that required to fully load the ship to her marks. It is therefore possible to arrange for one, or more, of the cargo tanks to be used for water ballast only. When loaded these tanks are empty and this enables the stresses in the deck and bottom to be reduced as a result of the extra buoyancy, and exemption can also be obtained for these water ballast spaces from tonnage dues.

The cargo tank section is divided by two longitudinal O/T bulkheads to form three tanks across. The cargo oil pump room forms part of the cofferdam at the after end of the cargo tanks.

As these ships increase in size, it is desirable to extend the cargo space over the greatest possible length to hold deck and bottom stresses to the minimum. It may also be necessary to fit three longitudinal bulkheads. Aft of the cargo space are the wing oil fuel bunkers with the settling tanks in the centre, the machinery spaces which are dealt with later, and finally the aft peak ballast tank, propeller, and rudder. Above the machinery spaces is the accommodation.

The construction of a large ship will involve as many as thirty different trades—platers, welders, plumbers, coppersmiths, engineers, electricians, etc, and to bring these altogether at the right time requires very large facilities and a highly efficient organization.

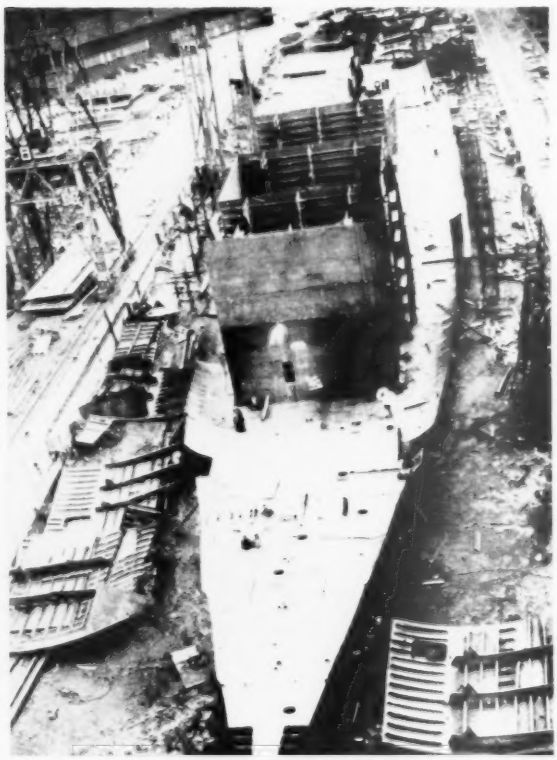


Fig 3. Large area of bottom plating laid with four centre transverse bulkheads

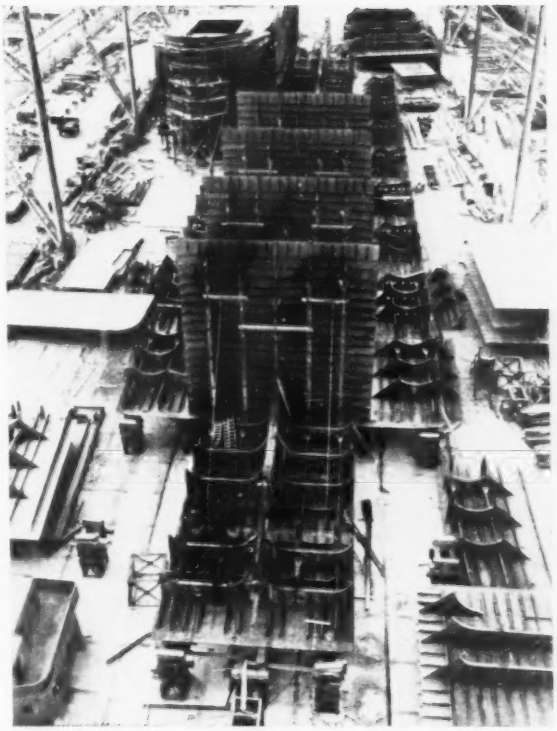


Fig 4. Note the small vessel being built at the bottom end of the slip. Large prefabricated sections are assembled ready for erection

As has been said, the large welded tanker lends itself to prefabrication enabling structural members weighing up to 50 tons, and in certain circumstances as much as 100 tons, to be completed on welding skids, then taken to the building berth and erected.

Prior to 1939, most shipbuilding yards were laid out for rivetted construction and little use was made of prefabrication. The ship was mainly constructed, plate by plate, and rarely were lifts of more than 5-10 tons made. Considerable modifications have now been made to most of the major building yards, so that large areas adjacent to the building berths are provided for the fabrication of the larger assemblies, and also additional cranage has been installed.

Another major problem associated with the building of very large tankers is launching, as ships of this size have a very heavy launching weight which imposes large strains on the structure when the aft end of the vessel is afloat whilst the forward end is still supported on the building berth. One method of circumventing this is the use of constructional dry docks and, particularly in the U.S.A., a number of these are in use. In some respects they offer considerable advantages over the normal ship-building procedure, and they also allow the ships to be waterborne without having to wait for particularly high tides.

The difference between an all-welded and an all-rivetted section can be seen in the cleanliness of the welded design and its symmetry of section, compared with the rivetted form of construction with its numerous brackets, sharp corners, and

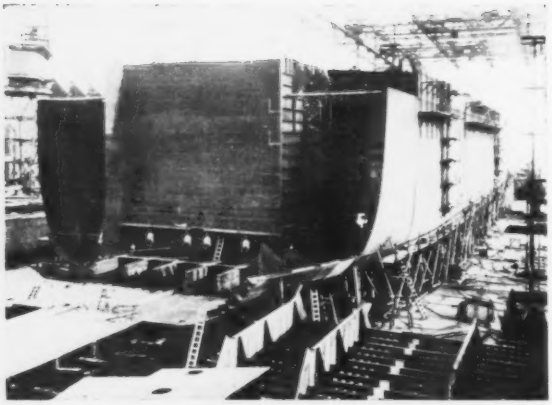


Fig 5. The centre cargo tank portion almost completely erected

the difficulty of making the structure tight. In the welded section a number of rivetted seams are installed to prevent the propagation of any fracture occurring in one welded portion to another. Submerged arc machine welding is generally used for shop work and also for joining any downhand seams on the slipway, hand welding being employed for the remainder.

Before commencement of construction on the buildingways, a considerable amount of prefabrication is usually carried out and in Fig 1 can be seen portions of the bottom shell plating laid on the building blocks with five sections of vertical centre keel erected and welded. The prefabricated lower centre portions of four transverse bulkheads are laid out on the bottom plating ready for erection.

Fig 2 shows the bottom plating complete with longitudinal stiffeners and transverse webs, and already in position are some centre and wing transverse bulkheads, longitudinal bulkhead, and shell panels. In the foreground is a prefabricated longitudinal bulkhead panel weighing about 40 tons. This 40 feet long section is complete from the bottom to the deck and, when placed in position, will only require to be welded round its extremities, and then have the bracket attachments made to the longitudinal stiffeners and vertical transverse webs. It is interesting to note the sections of cargo piping placed in the approximate positions which they will eventually occupy.

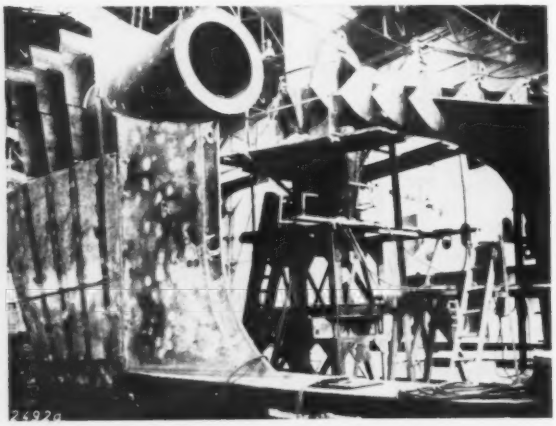


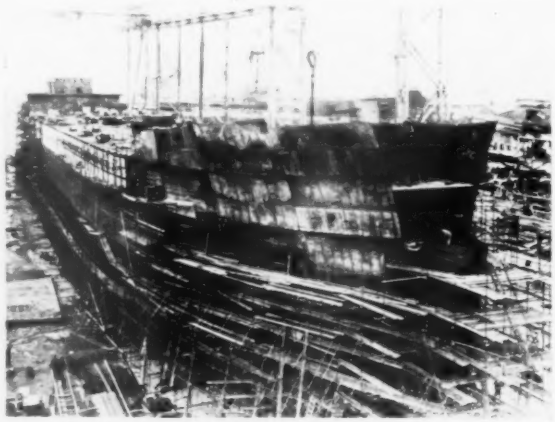
Fig 6. The sternframe being prefabricated in two portions

Another view of the bottom plating of the centre portions of bulkhead erected up to deck level can be seen in Fig 3, also prefabricated panels of shell plating lying around the slipway awaiting erection.

The building berths which have been arranged for assembly of prefabricated structure usually provide considerable space around the ship, and the economic use of the building berth can be seen in the erection of a small cargo vessel at the bottom end of the slipway, Fig 4, whilst construction of the centre portion of the tanker is proceeding. This supertanker now has four centre tank transverse bulkheads erected on the bottom plating, which is complete with longitudinals and transverses. This pattern of erection, together with the associated shell plate, will proceed until the entire cargo tank section of the vessel is complete up to the deck level.

Fig 5 shows this stage has been reached and the preparation and welding of the main transverse parts is in progress. The correct alignment of the large panels one to the other in order to obtain a good weld calls for a high degree of skill and accuracy. Welds in this position are highly stressed, and any faults in them would be liable to initiate the development of fractures. For this reason the weld junctions between major panels are subject to radiographic examination, and this practice is also carried out at other points in the structure where experience has shown that welding defects can be expected. Bulkhead pieces and valves are already in position in the pumproom, although the sides and after bulkhead of the pumproom have yet to be erected. The early installation of auxiliaries, piping, and other fitments within the hull is also a feature of this form of construction. The lifting facilities shown, though common to a number of yards, are not general, and it is more usual to have jib cranes running on tracks on either side of the building berth. It is an essential feature of this form of construction that the cranage is ample to handle the largest possible section which can be fabricated away from the berth. As an example, the sternframe is generally much too large to be constructed and erected as a single unit, and Fig 6 shows this unit fabricated in two portions, the assembly including the stern tube and several of the aftermost frames. It is usual to anneal these portions before transportation to the slipway for alignment and

Fig 7. The main hull is nearly complete except for the fore end



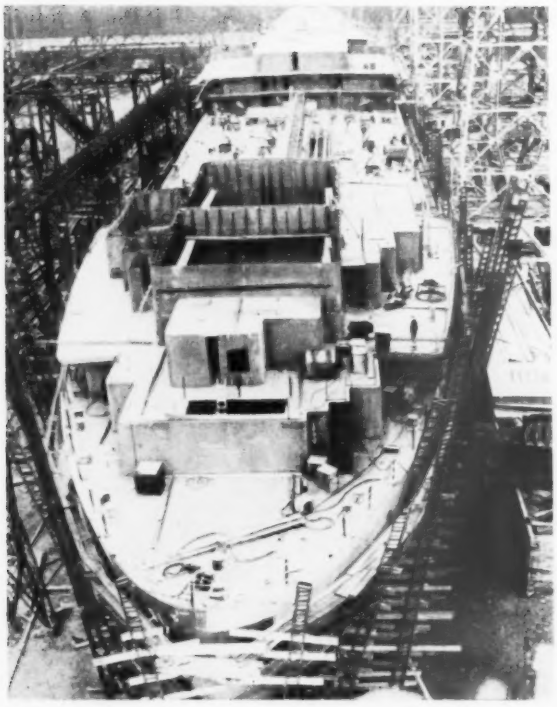


Fig 8. *View from aft. Main hull complete, deckhouses in course of erection*

welding into the surrounding structure. By modifying the rudder to the Spade type, it is possible to dispense with some of the large forgings incorporated in this assembly with simplification of the structure.

Fig 7 shows the vessel nearing completion with the main deck finished, but the fore end incomplete. Lower tiers of superstructure are being erected and cargo piping on deck is being assembled and placed in position.

Fig 8 shows a further state of construction with the main hull complete and painting commenced, and deck houses in course of erection. This photograph was taken in another shipyard and shows a different method of staging the main hull. Prior to any work being carried out all shell plating is pickled or sand/shot blasted to remove millscale, so as to leave a bare metal surface for priming before painting.

The ship is now ready for launching, Fig 9, and the forward poppet for supporting the bow temporarily during the launch is clearly visible. Immediately the vessel is waterborne and the after end floating, approximately half the weight is momentarily imposed on this forward poppet. The poppet structure consists of hardwood chocks ingeniously lashed and bolted together, moulded to the shape of the vessel, and supported in the sliding ways by a honeycomb of small softwood pieces. The softwood crushes as the stern floats and thus distributes the load over a very large area. As soon as the ship is in the water she must be secured very promptly and in some cases drag chains are fitted so that she stops immediately on entry, or if the launching area is large, anchors can be used in an emergency.

Fig 10 shows the vessel launched, and in this case anchors were used to bring it to a stop within the basin.

The propulsion machinery has gone through parallel stages of development with the increase in size of ship. In the early days following sail, steam engines with coal-fired boilers were in use, and these were superseded by oil-firing. This was followed by the diesel engine which is still popular with certain types of users, but in larger ships where powers greater than 15,000 hp are transmitted through one shaft, the diesel engine has suffered some setback. An attempt is now being made, however, to overcome this by the use of the pressure charged two-stroke engine which has undergone considerable development in the past decade. Steam turbine driven installations, therefore, propel the bulk of the larger tankers to which we are referring, and one of these is shown in Fig 11.

Here again, in post-war years, considerable progress has been made with this type of machinery. The impulse type turbine has largely supplanted the reaction type, and steam conditions have been raised to reduce fuel consumption to an economic minimum without impairing reliability. There are installations in use with pressures of 850 psig and temperatures as high as 1050° F at the superheater outlet, but the bulk of the installations are in the region 650 psig 850° F, with some of 860 psig 865° F. With the latter installations, fuel consumptions under trial conditions of about ·51 lb/shp/hr with about ·53 in service, can be attained. Unless further advance is made in the economic production and reliability of special alloyed component parts of the main installation, it is questionable whether steam conditions will be further raised as the paper economies in fuel consumption may be largely outweighed by the increased cost of maintenance.

The supertanker described earlier employs a machinery installation operating at about 860 psig and 865° F at the superheater outlet. The main machinery is of the impulse cross-compound type driving the propeller through a set of articulated double reduction gearing. Steam is obtained from two water tube boilers having integral furnaces and water-cooled walls.

Electrical power for pumps, forced draft fans, hotel services, air conditioning, etc is obtained from two turbo generators using steam at superheater outlet conditions.

A typical arrangement of a supertanker of this type has the machinery space divided in two; at the forward end the main machinery with its attendant auxiliary plant, and at the

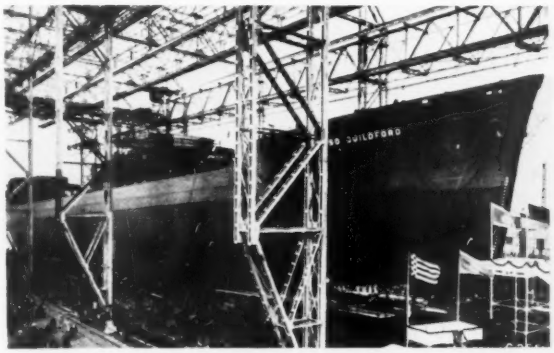


Fig 9. *A* 36,000 *dw tons tanker prior to launching*

Fig 10. *The same vessel after launching*

after end, a lower auxiliary engine room with the boilers situated above.

The turbines for driving the cargo oil pumps are located at the forward and of the engine room. In the large installation a crude cargo pumping rate of something in the region of 3500 tons/hr is required. To drive the pumps a turbine installation of about 3000 hp is provided. This size of specialized plant is in excess of the main propelling installation of many pre-war tankers. To obtain this output it is usual to have not less than four main centrifugal pumps with two reciprocating double-acting stripping pumps in the pump-room.

There are four stages of feed heating prior to the boiler, and the whole of the feed cycle operates on a closed system. It cannot be said that installations of this type are completely free from trouble; the alloy castings in use on the high pressure –high temperature side are subject to porosity failures, and the whole installation can become shut down owing to casting failure in a relatively small component. This can be largely overcome by the use of forged and fabricated fittings. Some trouble has also been experienced in the boilers due to tube failures resulting from scale build-up, and although considerable precautions are taken to avoid the entry of oxygen and CO_2 into the boilers, extreme care has to be taken to neutralize the effect of even the small quantities which do gain entry, and the resulting harm done to the feed system.

With the increasing size of tankers the mooring difficulties have grown, and windlass and winches of sufficient power have become so large and high as to be unmanageable. Capstans are now being fitted with the operating machinery situated under the deck, thus keeping the drums at working height.

In order to protect the internal structure of the tanks from corrosion, cathodic protection is being utilized to an increasing extent. This involves the placing of magnesium anodes inside those centre and wing tanks which will be filled with ballast.

Fig 12 shows a complete 36,000-ton ship. All cargo tank venting is done through flame screens and pressure vacuum valves, individual vents being led through grouped lines to exhaust well clear of the deck.

In developing these ships, the crews who man them have not been forgotten, and accommodation now provided is of such a high standard that it is unlikely its equal can be found on any other type of ship. The accommodation is air-conditioned throughout, tastefully decorated, and carefully planned to give the best measure of safety. Single cabins are provided for all members of the crew who are situated on the upper deck. P.O.'s, stewards, all messrooms, and the galley are on the poop deck. The engineer officers are housed on the boat deck, whilst the deck officers' cabins are in the bridge amidships.

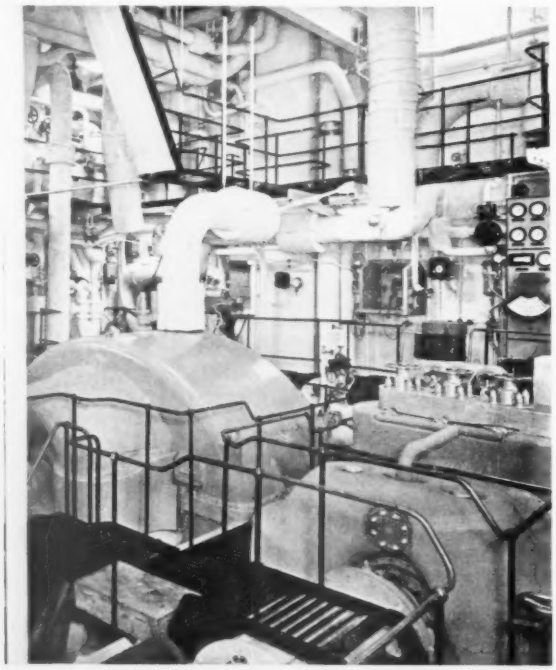


Fig 11. *Engine room of steam turbine-driven* Esso Windsor

Fig 12. *The* 36,000 *dw tons tanker,* Esso Windsor

In conclusion, acknowledgement is made of the kind permission of Esso Petroleum Company to publish this paper and of the help given by colleagues in its preparation.

World Oil Industry in 1958

Over the last two or three years The British Petroleum Company Ltd has issued annually an extremely useful booklet on salient world oil statistics for the previous year. The 1958 *Statistical Review of the World Oil Industry* is now available and covers a similar field to those previously issued. The commentary is summarized as follows.

Reserves

The increase in reserves, although substantially greater than production, was less than in recent years. The largest expansion once again took place in the Middle East, where reserves rose from 22,665 million tons in 1957 to 23,250 million in 1958. In the U.S.A., reserves recovered from the set-back recorded twelve months ago to show an increase for total crude oil and natural gas liquids of 90 million tons, reaching a figure of 4770 million tons at the end of 1958.

The figure for Africa showed the most spectacular increase, being 540 million tons at the end of 1958 compared with 110 million in the previous year. Details are given in Table I.

Production

The increase in total world crude oil production, at 3 per cent above 1957, was below the average of recent years. Western Hemisphere output was depressed by the economic recession in North America, whilst Middle East production virtually resumed the trend which was interrupted by the Suez crisis.

Consumption

World demand for petroleum products, at 933 million tons, was some 6 per cent higher than in 1957, which is almost as high a rate of increase as the average recorded for the past five years. In spite of the slight retarding influence caused by the slowing down of economic growth in Europe, consumption showed an increase of 15 per cent over 1957. The U.S.A. accounted for 47 per cent of the world total, and increased its volume of demand by 3 per cent over the previous year. Full details can be seen in Table II.

TABLE I

WORLD "PUBLISHED PROVED" OIL RESERVES AS AT END 1958 AND 1957

(million tons)

Western Hemisphere	1958	1957	*Eastern Hemisphere*	1958	1957
U.S.A.			MIDDLE EAST:		
Crude Oil ...	4,050	4,020	Iran	4,430	4,295
Natural gas liquids	720	660	Iraq	3,300	3,300
			Kuwait	8,100	8,100
	4,770	4,680	Neutral Zone ...	850	710
			Qatar	320	225
CANADA	485	430	Saudi Arabia ...	6,200	5,935
MEXICO	345	380	Other Middle East	50	100
ARGENTINA ...	140	105			
COLOMBIA ...	100	90	Total ...	23,250	22,665
PERU	45	35			
TRINIDAD... ...	55	45	AFRICA	540	110
VENEZUELA ...	2,325	2,255	WESTERN EUROPE	200	190
OTHERS	55	35	EAST INDIES ...	1,200	1,075
			OTHER FAR EAST	80	65
			U.S.S.R. BLOC ...	3,525	3,320
TOTAL W. HEMISPHERE	8,320	8,055	TOTAL E. HEMISPHERE	29,020	27,650

World totals: 1958, 37,340; 1957, 35,705.

TABLE II

WORLD OIL CONSUMPTION 1958 AND 1957

	1958 *Million tons*	1957 *Million tons*	*Change* 1958 *over* 1957 *(per cent)*	*Change* *Average* 1953 *to* 1958 *(per cent)*	1958 *Share of total (per cent)*
U.S.A.	437	425	+3	+3	47
Canada	36	37	−2	+8	4
Mexico	13	13	+5	+3	1
Caribbean	18	18	—	+2	2
Other West	47	45	+6	+9	5
Total W. Hemisphere ...	551	538	+3	+4	59
Western Europe ...	156	136	+15	+13	17
Africa	29	28	+4	+6	3
Middle East	20	19	+7	+20	2
East Indies	7	6	+5	+7	1
Australasia	11	11	+6	+7	1
Other East	42	40	+8	+12	4
U.S.S.R. etc.	117	104	+12	+13	13
Total E. Hemisphere ...	382	344	+11	+12	41
World, excl. U.S.S.R. etc.	816	778	+5	+6	87
World	933	882	+6	+7	100

Supply and Demand

The increase in demand was partly met from the large volume of stocks which had been built up in the U.S.A. during 1957. Some 85 per cent of the exports entering international oil trade came from the Middle East and the Caribbean.

Refining

World refinery capacity by the end of 1958 had increased by about 8 per cent over that of twelve months previously. All areas of the world shared in this increase, and whereas the U.S.A. still held 43 per cent of total world refinery capacity, Western Europe, easily the second most important region, was responsible for 16 per cent.

Tankers

The world tanker fleet showed an increase of some 6 million dw tons over 1957, representing a rise of over 12 per cent. Of the world total of 55·7 million dw tons recorded at the end of 1958, 19·3 million was owned by oil companies. Britain's share of the world fleet was 16 per cent, coming second to Liberia, which had 19 per cent of tonnage under its flag. The volume of laid-up tonnage was over 4 million dw tons at the end of the year.

* * *

COUNCIL ELECTIONS 1960

Members are reminded that, under By-law 72, all nominations for the Council Elections in 1960 must be received by the General Secretary not later than 31 December 1959.

Applications must be made on the special Council Election form, proposed by a corporate member, and supported by six corporate members. Forms are obtainable from the General Secretary.

Personal Notes

Sir Henry Jones, deputy chairman of the Gas Council since 1952, has been appointed to succeed Sir Harold Smith, K.B.E., as chairman on 1 January 1960.

Sir Henry Jones

Sir Henry was educated at Harrow and Pembroke College, Cambridge, where he took an engineering degree. Before the war he was engaged in integrating gas companies into more economic units, a task which is now being accomplished on a much larger scale by the nationalized industry. He also became deputy chairman of the Wandsworth and District Gas Company as well as a director of several other companies.

When the gas industry was nationalized ten years ago Sir Henry became chairman of the East Midlands Gas Board, where he remained until 1952. He received his knighthood in the 1956 New Year Honours List.

He is a director of the NIFES, British Coke Export Sales Corporation, Benzole Producers Ltd, and Association pour L'utilisation du Coke en Scandanavie.

W. K. Hutchison, who is to become the deputy chairman of the Gas Council, has been chairman of the South Eastern Gas Board since its formation in 1948.

W. K. Hutchison

He read Chemistry at Corpus Christi College, Oxford, after obtaining a scholarship from Edinburgh Academy, and joined the Gas Light and Coke Company as a research chemist in 1926. Not long after war broke out he was seconded to the Air Ministry and served successively as assistant director and director of hydrogen production. Later he became director of compressed gases. After the war he returned to the Gas Light and Coke Company and became Controller of By-products, and in 1947 he joined the board of the Company.

Mr Hutchison is the president of the Institution of Chemical Engineers, and past president of the British Road Tar Association and of the Institution of Gas Engineers. He is also a member of the Committee on Coal Derivatives set up by the Minister of Power.

R. C. Curtis, executive vice-president of Jersey Production Research, will succeed Dr Tongberg as president.

Dr Tongberg holds a Bachelor of Science degree in chemistry from Harvard University and received his Master's from Harvard in 1930. Later he taught in the field of petroleum refining at Pennsylvania State University and received his Ph.D. there in 1936.

Dr Carl O. Tongberg has been elected executive vice-president of Esso Research and Engineering Co. He is currently president of Jersey Production Research Co., Tulsa, Okla., a post he has held since April 1958.

He joined Esso Research in 1937, and became director of the products research division in 1953. He was elected a vice-president and director of the company in 1954. Dr Tongberg left Esso Research in 1956 to become vice-president and a director of the Carter Oil Co., another Jersey Standard affiliate.

Mr Curtis received his degree in chemical engineering in 1937 from Texas A. & M. College. Shortly after graduation, he joined the Oklahoma City production office of the Carter Oil Co.

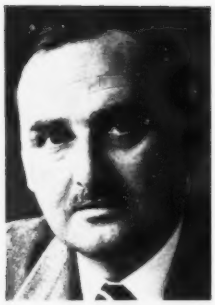
After holding a number of engineering posts with Carter Oil in Oklahoma, he was named production manager of the Company's Northern Division office at Billings, Montana, in 1953, and later became manager of the Eastern Division.

Mr Curtis became vice-president of the newly-formed Jersey Production Research Co. in 1958, and was named executive vice-president in March 1959.

On the 14 July **R. W. L. Fox**, who celebrated his 40th anniversary with Mobil Oil Company last October, retired from the Company. He was presented with a cocktail cabinet, and an album signed by his many friends at work, by J. C. Gridley, the chairman. Seen in the photograph after the presentation are, left to right, C. Lawrie, director, J. Blake Middleton, director, Mr Gridley, Mr Fox, H. W. Rocke, managing director, and G. A. Dickins, manager, Technical Services Department.

During the past few years, Mr Fox has been the Company's co-ordinator for lube and allied products in the Technical Services Department. At the outbreak of the war, Mr Fox was loaned to the Petroleum Board Lubricating Oil Pool Technical Committee to act as secretary. He has also been a member of the Lubricating Oil Sub-Committee of the Admiralty Fuels and Lubricants Advisory Committee.

Philip W. Lake has been appointed secretary and **M. Field** has been appointed assistant secretary, of Edwin Cooper & Co. Ltd, a member of the Wakefield Castrol Group which specializes in chemicals for the oil industry.



G. Williams

George Williams has been appointed project and development executive of the Wakefield Castrol Group of Companies.

Mr Williams was formerly head of the Castrol Motor Oil international racing organization and is succeeded in this position by **James Hill.**

Alec Mosley

Alec Mosley has been appointed public relations officer of Mobil Oil Co. Ltd in succession to Peter Matthews.

Mr Mosley left Oxford University in 1948, worked as a journalist, and in 1951 joined the Westminster Press Group on the editorial staff of the *Oxford Mail*. In 1956 he was appointed local editor of a weekly newspaper published by the Oxford Mail & Times Ltd. He joined Mobil as an editorial assistant on the public relations staff.

Mr Matthews joined Mobil in 1951 as a trainee from Cambridge and took charge of public relations activities in January 1953. He is leaving the Company to join Arthur Tooth & Sons Ltd.

His many friends in the oil industry will be sorry to learn of the death of **Heinrich von Riedemann** at the age of 88, at his home in Vancouver, B.C.

He succeeded his father, Wilhelm Anton Riedemann, as chairman of the German affiliate of Standard Oil Company (New Jersey). In 1927 he was appointed a director of Standard Oil Company (New Jersey), and prior to his retirement in 1939 was engaged in the organization and co-ordination of the various activities of the European and South American affiliates of the Group.

J. E. Winscombe, M.I.Mar.E., A.F.Inst.Pet., chief marine engineer of Shell-Mex and B.P. Ltd, and a member of the Company since 1928, retired on 30 June.

He has been succeeded by **W. B. Abel,** M.I.Mar.E., who joined the Company as deputy chief marine engineer in 1957, and who was formerly marine superintendent of the National Benzole Co. Ltd.

Mr Winscombe served an apprenticeship with John Shearman and Co. Ltd, engineers and ship repairers, Avonmouth. In 1920 he joined the Bay Fleet of the Hudson Bay Company and was based at Marseilles and later was on special duties in Siberia, Alaska, and Eastern and Western Canadian Arctic.

He joined Shell-Mex and B.P. as assistant divisional engineer at Newcastle in 1928, and was appointed divisional engineer two years later. During the second world war he was three years at head office on special duties connected with the government storage of petrol.

In 1947 he became assistant manager, Engineering Department, and chief marine engineer in 1953.

M. S. Lush, C.B., C.B.E., M.C., has resigned his appointment as managing director of Pakistan Shell Oil Company Ltd prior to his return to England, where he intends to settle after over 40 years' service abroad. He had a distinguished career in many countries in the Sudan Political Service, British Military Government (in the second world war), and the International Refugee Organization.

Mr Lush joined Shell in 1952 as adviser on Libyan affairs and played a part in the discussions with the Libyan Government on the oil law of that country. He then established the Pakistan Shell Oil Company in 1956, since when the Company has carried out extensive exploration surveys in East and West Pakistan and has drilled two dry wells at a total expenditure of nearly £6 million.

K. Fearnside has been appointed to the Board of Smiths Aircraft Instruments Ltd as director of research. Formerly research manager at the Company's Cheltenham factory, he will continue to have charge of research activities in his new appointment.

Mr Fearnside was educated at St John's College, Cambridge, where he graduated with First Class Honours in both parts of the Natural Sciences Tripos, being awarded the Hocken Prize in Physics.

In October 1946, he was appointed to the Atomic Energy Research Establishment, Harwell, where he did work in basic nuclear physics and the application of radioactive isotopes for industrial purposes. His next appointment was in March 1950 as Technical Director of a newly-formed Company, Isotope Developments Ltd, and in 1953 he joined Smiths Aviation Division to take charge of systems studies in the newly-formed Guided Weapons Department.

A. M. Mackintosh, O.B.E., M.C., of Shell-Mex and B.P. Ltd, retired recently after a long and distinguished record of service in management in petroleum distribution.

A. M. Mackintosh

He joined the old British Petroleum Company in 1922, and became one of the original group managers when Shell-Mex and B.P. was formed in 1932.

Mr Mackintosh became chief general sales manager of the Company in 1948 and was appointed general manager—sales in 1954. On his retirement from that position in 1957, Mr Mackintosh became the general manager responsible for liaison duties between the National Benzole Company Ltd, the Power Petroleum Company Ltd, and Shell-Mex and B.P. Ltd.

Nash and Thompson Ltd, Chessington, Surrey, announce the reorganization of their Sales Division. In the change, **D. E. Morris,** previously a sales engineer in the Company, has been promoted to sales office manager with special responsibility for process control, oil, gas, mining, medical, and survey equipment.

Notes of the Month

SONJ to Consolidate U.S. Affiliates

Standard Oil Company (New Jersey) and Humble Oil & Refining Company (98·27 per cent of the outstanding shares of which are owned by the Jersey Company) have announced a proposal to merge, as the first step in a plan for the ultimate consolidation of all producing, refining, marketing, and marine operations of Jersey affiliated companies in the United States, for nationwide operation under unified management.

Such operations are presently conducted principally by The Carter Oil Company, Esso Standard Oil Company, Humble Oil & Refining Company, Oklahoma Oil Co., and Pate Oil Company, all of which (with the exception of Humble) are wholly owned by SONJ.

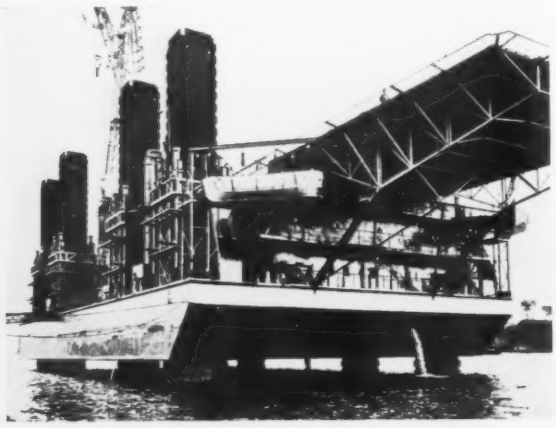
It is anticipated, in connexion with the Jersey-Humble merger, that the stockholders of Humble (other than Jersey) would receive five shares of Jersey stock for each four shares of Humble stock held by them. Following further study of the proposal, a merger agreement is expected to be entered into between Jersey and Humble which will set forth definitively the terms of the merger subject to the approval of the shareholders.

Prior to the merger the plan calls for the organization of a new Humble Oil & Refining Company, to be incorporated in Delaware, to which the properties and operations of the present Humble Oil & Refining Company (incorporated in Texas) would be transferred in exchange for 100 per cent of the stock of Humble (Delaware).

Following such steps, it is planned to merge Carter, Esso Standard, Oklahoma, and Pate into Humble (Delaware) with that corporation being the surviving company. It is contemplated that, initially, the units now operating as individual companies will continue to operate, in general, under their present names and managements as divisions of the new company.

New Marine Drilling Platform for Persian Gulf

A new mobile oil drilling platform, the *Seashell*, began at the end of August a 6400-mile tow from Schiedam, Holland, to Qatar on the Persian Gulf.



The new mobile drilling platform for Qatar

The *Seashell* (the unit is also known by an Arabic version of its name) is towed by two Dutch tugs, the 2500-hp *Gele Zee* and the 1350-hp *Loire*, and the journey to Qatar is expected to take more than two months.

After it has reached its destination, the off-shore waters of the Qatar Peninsula, the *Seashell* will resume the search for oil under the sea bed in the concession area of The Shell Company of Qatar Ltd. It will be recalled that a similar unit was damaged beyond repair in a storm in the Persian Gulf more than two years ago. The exploration venture in this area has already cost close to £7·5 million.

Built by NV Gusto Shipyard at Schiedam for the Royal Dutch Shell Group of Companies, this new platform is designed to withstand gales up to 100 mph and waves 30 feet high, while working in water 90 feet deep.

With drilling equipment installed it will be possible to drill several wells, to a depth of 15,000 feet, from one site.

Oil Prospecting in British Honduras

A joint exploration company, Sinclair and BP Exploration Inc, has been granted an oil prospecting licence by the British Honduras Government covering about 1000 square miles in the northern part of the country.

Sinclair and BP Exploration Inc was formed early this year by BP and Sinclair Oil Corporation to engage in oil exploration and production ventures, primarily in Latin America.

Exploration in Senegal

As the latest stage in the programme of oil exploration in Senegal, French West Africa, two test wells are being drilled for Société des Pétroles du Senegal, in which the BP Group has a 50 per cent interest.

Both wells are being drilled by French contractors, the first, Diourbel No. 1 Test, in north central Senegal, and the other, Kolobane No. 1 Test, about 30 miles to the east.

Elsewhere in the territory, two French seismic parties and a BP seismic party are at work for Societe des Petroles du Senegal.

More Drilling in Papua

A new test well in Papua—at Bwata (15 miles to the north-west of Puri, where a show of oil was discovered last November) is being drilled by Australasian Petroleum Company, in which BP is associated with American and Australian interests. The company announces in Melbourne that a depth of 1016 feet has now been reached.

The drilling rig and equipment were transported by helicopter across 25 miles of impenetrable jungle from a base on the Era River. This is the fifth location to which a "helirig" has been transported in Papua by three Sikorsky helicopters, which were first used in 1957. Each machine is capable of lifting a load of about 4000 lbs.

At the Puri well a testing programme is continuing.

Oil Industry's Investment in Australia

In the next two years the Australian oil and allied industries will spend approximately £60 million on development projects, in addition to expenditure on marketing and oil search. The Petroleum Information Bureau (Australia) says

this heavy capital investment is required to meet the rapidly increasing demand in Australia for petroleum products.

Among new projects to be undertaken in the next two years are the expansion and construction of petrochemical industries at Geelong and Altona, Victoria, and at Clyde, New South Wales.

The construction of a 32,000-ton oil tanker at Whyalla, South Australia will cost £3 million, and will be the first large modern tanker to be built in an Australian shipyard.

Other major developments include the construction of a £16 million refinery at Hallett's Cove, South Australia, and extensions to cost £12 million at the Kurnell refinery in New South Wales.

Oil Refinery for Mombasa

The Governor of Kenya and the general manager of The Shell Company of East Africa Ltd and BP (East Africa) Ltd announce that an agreement has been signed under the terms of which an oil refinery will be constructed in the Changamwe industrial area of Mombasa.

A refinery will naturally be of great benefit to the economy of East Africa and, at the instance of the Government, provision has been made for other companies to be associated with this venture.

Anti-Corrosion Tests on "British Kiwi"

Large-scale experiments with a variety of paints will be carried out on BP Tanker Company's ship, *British Kiwi*, when she is commissioned later this year. Launched from Smith's Dock Company's yard at Middlesbrough on 21 July, this is the first ship built for BP Tanker Company in which all the steelwork has been shot blasted before erection.

Advantage is being taken of this method of surface preparation on the outside of the ship to compare the performance of conventional underwater paints with a vinyl composition paint and an epoxy resin-based paint.

Epoxy resin-based paints, supplied by nine different manufacturers, will be applied to the internal walls of most of the cargo and ballast tanks; an *iso*-cyanate paint will also be used. In certain of the cargo ballast tanks, cathodic protection will be employed in conjunction with the painting of the deckhead. In one tank all ten paints will be compared. Thus every oil-carrying tank on the ship will have protection against corrosion, except one which will be left bare, at least at first, for comparative purposes.

It will be at least two years before any definite results can be expected from the experiments.

Launch of Britain's Biggest Tanker

The Queen Mother accompanied by Sir Neville Gass

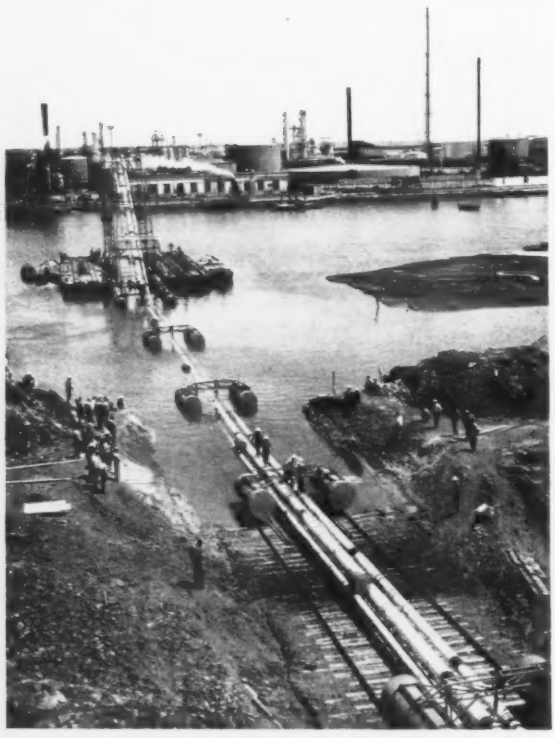
Built by John Brown and Company in the same Clydeside yards from which the *Queen Elizabeth* and the *Queen Mary* were launched, Britain's biggest tanker to date was named *British Queen* by HM Queen Elizabeth the Queen Mother, on 16 September. After fitting out on the Clyde the vessel will join The British Petroleum Company's fleet.

British Queen, which is BP Tanker Company's first 50,000 dw-ton vessel, has an overall length of 760 feet and breadth of 97 feet. Her single screw, driven by steam turbines capable of developing a maximum of 17,600 shaft horsepower, will give her a loaded speed of 15½ knots.

The latest navigation equipment, including radar, radio direction finder, V.H.F. radio telephone, echo sounder, and automatic speed, distance, and draught indicating equipment, will be installed in the vessel.

An artist's impression of Britain's biggest oil tanker

Pipe-Laying Under Venetian Canal



An unusual pipe and cable laying operation was successfully completed recently at Venice refinery, Porto Marghera, which is jointly owned by BP and the Italian oil organization, AGIP.

The operation involved the laying of a 12-inch crude oil line, an insulated 6-inch steam line within a 16-inch pipe, an 8-inch fire-fighting water line, a 3000V electric power cable, a telephone cable, and a pilot cable, under the Vittorio Emanuele Canal to connect the refinery with a new crude oil tank farm under construction at the Isola dei Petroli.

As the canal is the main waterway to Porto Marghera, the local authorities could not allow it to be closed to traffic for more than 24 hours and, therefore, it was decided to lay the pipes and cable across the 250 yards wide stretch of water in a single operation.

At the Isola dei Petroli island, the pipes and cables were bound together and attached to a special structure, made with wheeled supports and floats, placed on a tracked runway some 330 yards in length, leading to the canal crossing point. When ready, the floating structure with pipes and cables was drawn across the canal by means of a motor winch erected on the refinery side.

After the pipes and cables were across the canal, they were sunk under the supervision of divers and laid into a prefabricated concrete channel which had been previously placed in the canal bed. When this part of the operation was over, the concrete channel was completely covered, first with a layer of concrete, and then with a layer of stones and earth.

The whole launching and sinking operation was completed in about 15 hours.

Oil Companies' Equipment Orders

During the first quarter of 1959 orders for materials and equipment placed in the United Kingdom by oil companies were valued at £29,166,155, according to figures compiled by the Oil Companies' Materials Association and issued by the CBMPE.

Total value of orders for the quarter declined by £3,360,044 compared with the same quarter of 1958. There were decreases in value for the following groups; specialized equipment for oil drilling and production; specialized equipment for oil refineries, etc; tubulars, pipe-fittings, and valves; electrical equipment; ferrous and non-ferrous plates, sections, sheets and bars; automotive equipment; cement and other building materials, and hardware; and commissary and general requisites.

Increases were registered in the remaining groups, certain categories showing quite notable rises. Geophysical and other exploratory equipment; railcars, road tankers, aircraft refuellers, etc; and boilers and boiler house plant were particularly outstanding, having increases in the region of 100, 140, and 510 per cent, respectively. Full details are given in the table.

	1959 *Jan.–Mar.*	1958 *Jan.–Mar.*
Geophysical and other exploratory equipment, etc.	30,809	15,241
Specialized equipment for oil drilling and production, including oil casing, tubing, etc.	2,756,544	3,509,942
Specialized equipment for oil refineries, etc. (not including pumps and valves)	1,097,525	3,291,172
Drums and can-making, filling and cleaning equipment, kerbside pumps, and other metering and dispensing equipment, etc.	354,432	274,293
Railcars, road tankers, aircraft refuellers, etc.	192,097	80,308
Drums, drumsheets, and tinplate ...	2,267,229	1,878,773
Tankage (including tank fittings) ...	973,311	672,528
Tubulars, pipe fittings, and valves (ferrous and non-ferrous)	2,821,522	4,315,470
Pumps (excluding slush, oilwell, and kerbside)	398,594	377,344
Boilers, boiler house plant and accessories, etc.	748,797	122,733
Electrical equipment—motors, generators, transformers, etc.	1,446,510	2,456,802
Instruments, meters, and gauges, etc....	533,849	385,712
Prime movers and compressors ...	804,838	719,345
Machine and hand tools, welding and miscellaneous machinery and stores	3,049,252	2,421,153
Ferrous and non-ferrous plates, sections, sheets, and bars	810,306	1,376,045
Automotive equipment, all types ...	2,300,641	2,360,862
Laboratory equipment and chemicals, including hospital and medical supplies	372,184	328,125
Bulk chemicals, catalysts, barytes, etc.	6,104,923	5,161,398
Cement and other building materials and hardware, including timber ...	531,491	865,466
Commissary, general requisites for office, warehouse, household, club and sports, etc.	1,571,301	1,913,487
	£29,166,155	£32,526,199

Octavia Hill Link with the Wakefield Building

In the entrance hall of this modern office building a permanent tribute will be paid to someone whose pioneer work from that very spot, nearly a century ago, influenced the reforms which were to come in the living and working conditions of the people.

Octavia Hill lived, for twenty years until her death in 1912, at 190 Marylebone Road—an address which forms part of the site on which Castrol House, the headquarters of C. C. Wakefield & Co. Ltd, is nearing completion.

Most of Octavia Hill's work was carried out within the borough of St Marylebone. She was a champion of the open spaces movement and one of the three founders of the National Trust.

There is an L.C.C. plaque on the wall of her first London home in Fitzroy Street, and this other plaque in Castrol House will provide a similar link with the past.

Castrol House as it will be when completed, and (inset) the house where Octavia Hill lived

Water Detector for Jet Fuel Refuelling

A simple chemical powder test can now be used at airports to detect extremely small traces of water in jet fuels. Developed by Esso Research and Engineering Company, the new "Hydrokit" test is a quick and reliable way of making last-minute checks for water content during refuelling operations.

By its molecular nature, jet fuel is very susceptible to contamination by water, much more so than aviation gasoline. Moreover, chances of water contamination are much greater because turbine-engined aircraft take on much larger quantities of fuel and at much faster rates than piston-engined aircraft.

Currently used water detectors do not seem to give a clear indication of free water contents below about 0·01 per cent by volume in the fuel (*i.e.* 100 parts per million) and most aircraft operators believe this is too high. The "Hydrokit" discloses the presence of as little as 30 ppm of water—an eggcupful in several hundred gallons.

Fuel samples are tested as the fuel is being delivered into the plane. The test is extremely sensitive, and so easy that it can be repeated several times during refuelling. As the "Hydrokits" become available in quantity, the test will be used to check the fuel put on board aircraft on a routine basis. It is now being delivered to Esso's world-wide network of aviation marketers and will soon be made available to others in the aviation industry.

New Latex Plant for International Synthetic Rubber

Toward the end of their first year of bulk production at the Hythe, Southampton, plant, the International Synthetic Rubber Company Ltd announces that work has started on a new plant to produce general purpose synthetic rubber Latex.

The new plant has been designed to produce 2½-million gallons of rubber Latex a year for use in foam rubber articles, in carpet backing, adhesive paper, upholstery, and other industries.

The International Synthetic Rubber Company's plant, costing £6 million, was Britain's first venture in the bulk manufacture of general-purpose synthetic rubber. The plant has a capacity of 70,000 tons a year and makes the United Kingdom independent of overseas sources of this material.

POL Reunion

The Royal Army Service Corps POL (Officers) Club, for ex-officers of units which had a vital responsibility in the war, little known today outside the oil industry, are having their next reunion on 6 November 1959 at the RASC Officers' Mess, Regent's Park Barracks, London, N.W.

The 1959 reunion will be the thirteenth, and some 100 ex-officers are expected to attend. Although this is a high proportion in relation to the compact force of POL officers in all theatres throughout the war, the Club's Committee believe more would come if they were reminded about it.

Ever since the Club was formed meetings have been held informally on the night of the first Friday in each month at Shell-Mex House, London. Membership is available to all serving, retired, and wartime officers of POL Headquarters and units, and to those officers of other arms of the services who were employed on POL duties.

The honorary secretary of the Club is Douglas Arden of "Lathrisk", Chalton Road, Bridge of Allan, Stirlingshire. Tickets for the reunion, which includes buffet supper, are £1 each.

The Rise in U.K. First Half Year Oil Imports

Imports of oil into the United Kingdom during the period January–June 1959 showed a total increase of 1,443,751 thousand gallons, or 26·8 per cent. The proportion of crude oil imported rose by some 1·3 per cent to account for 76·4 per cent of the total imports.

The only refined product to register a decrease in quantity in the 1959 period was spirit other than motor spirit. Kerosine and lubricating oils, with increases of 55 and 43 per cent respectively, were particularly prominent in the overall increase of products. Among the black oils the rise in the imports of diesel oil were especially noteworthy, being 43,922 thousand gallons in January–June 1959 compared with 5419 thousand in the corresponding six months of 1958.

The most noticeable changes in the pattern of supply were

IMPORTS OF PETROLEUM INTO THE UNITED KINGDOM
(Thousand gallons)

	January to June 1959							January to June 1958	
	Crude petroleum	*Motor spirit*	*Kerosine*	*Gas, diesel, and fuel oils*	*Lubricating oil*	*Total*	*Percentage of total*	*Total*	*Percentage of total*
MIDDLE EAST									
Kuwait	2,138,294	—	—	—	—	2,138,294	31·3	2,088,168	38·7
Iraq	701,821	—	—	—	—	701,821	10·3	496,957	9·2
Iran	843,081	11,625	—	—	—	854,706	12·5	404,565	7·5
Saudi Arabia	81,114	—	—	1,548	—	82,662	1·2	156,701	2·9
Bahrain, Qatar, and Trucial States	221,386	50,286	20,806	66,541	—	359,019	5·3	212,358	3·9
Aden	—	26,664	27,539	—	—	54,203	0·8	27,529	0·5
	3,985,696	87,575	48,345	68,089	—	4,190,705	61·4	3,386,278	62·7
CARIBBEAN AND SOUTH AMERICA									
Venezuela	880,838	—	28,395	215,164	4,138	1,128,535	16·5	712,807	13·2
Netherlands Antilles	68,125	29,755	44,064	98,911	11,544	252,399	3·7	220,705	4·1
Colombia	132,225	—	—	—	—	132,225	1·9	20,798	0·4
Peru	16,019	—	—	—	—	16,019	0·2	16,451	0·3
Trinidad	—	92,788	25,463	149,667	—	267,918	3·9	161,452	3·0
	1,097,207	122,543	97,922	463,742	15,682	1,797,096	26·2	1,132,213	21·0
UNITED STATES	8,235	32,236	1,162	49,911	18,236	109,780	1·6	96,634	1·8
EUROPE									
Netherlands	23,781	35,292	56,513	151,134	10,048	276,768	4·1	354,077	6·6
France	—	25,567	589	29,078	1,606	56,840	0·8	63,083	1·2
Italy	—	16,939	—	67,029	—	83,968	1·2	56,472	1·0
West Germany	—	—	—	4,900	—	4,900	0·1	2,921	0·1
Soviet Union	—	—	—	—	3,998	3,998	0·1	1,981	—
	23,781	77,798	57,102	252,141	15,652	426,474	6·3	478,534	8·9
FAR EAST									
Sarawak	14,413	—	—	—	—	14,413	0·2	47,103	0·9
OTHER COUNTRIES									
British Commonwealth	42,507	5,196	80	32,013	13,211	93,007	1·4	46,913	0·9
Foreign	50,676	53,981	10,748	67,859	2,242	185,506	2·7	183,223	3·4
	93,183	59,177	10,828	99,872	15,453	278,513	4·1	230,136	4·3
GRAND TOTAL	5,222,515a	380,329	215,359	933,755b	65,023	6,834,025d	100·0	5,390,274e	100·0
PERCENTAGE OF TOTAL	76·4	5·7	3·1	13·7	1·0	100·0	—	—	—
GRAND TOTAL Jan.-June 1958	4,048,422	334,728	138,719	803,605c	45,424	5,390,274e	—	—	—
Percentage of total	75·1	6·2	2·6	14·9	0·8	100·0	—	—	—

a Of this total 144,237,000 gallons was refinery feed.
b Made up of gas oil, 308,230,000 gallons; diesel oil 43,922,000 gallons; fuel oil, 581,603,000 gallons.
c Made up of gas oil, 269,859,000 gallons; diesel oil, 5,419,000 gallons; fuel oil 528,327,000 gallons.
d Including 17,044,000 gallons "other spirit" not included elsewhere.
e Including 19,376,000 gallons "other spirit" not included elsewhere.

the rise in proportion of imports from Latin America from 21 per cent to over 26 per cent (Venezuela being particularly prominent within this rise), the drop in the Middle East's proportion—although its total volume increased—and the decrease in volume and proportion from other countries of Europe.

The Middle East still contributed over 60 per cent of total U.K. oil imports, and considerable increases were registered in 1959 in Iraq, Iran, and Aden (both the latter being doubled). On the other hand supplies from Saudi Arabia were cut by some 48 per cent. This can be balanced by the fact that imports from Bahrain, Qatar, and the Trucial States rose considerably, for a large proportion of Bahrain's crude supplies emanate originally from Saudi Arabia.

Imports from the U.S.A. rose slightly whilst those from British Commonwealth countries were virtually doubled.

Full details are given in the accompanying table.

* * *

C. EUGENE DAVIS

Visitors to the Fifth World Petroleum Congress and many others of our readers will learn with regret that C. Eugene Davis passed away suddenly on 1 October. Gene Davis, as he was known to his many friends, will particularly be remembered as the very helpful general secretary of the board of directors of the New York Congress. To those who required assistance Gene was always on hand to do what he could, and under his guidance a very efficient organization was set up to bring the Congress to an undoubted success.

C. Eugene Davis

In the petroleum industry Gene Davis first started work for the Shell Oil Company in 1917 in their refinery at Cushing, Oklahoma. He continued his service in various Shell refineries and in positions of increasing responsibility until, in 1932, he was transferred to the manufacturing-operations department in St Louis. In 1933 he became assistant to the manager in that department and five years later was made assistant to the vice-president in charge of manufacturing. In 1943 he was made general manager of manufacturing and two years later was elected vice-president in charge of manufacturing for Shell's East of the Rockies area. When the East and West Coast activities of the Company were consolidated in January 1949 he became vice-president in charge of refining, a position which he held until his retirement in 1955.

INSTITUTE OF WELDING OFFICERS

E. Seymour-Semper, M.I.Mech.E., has been elected president of the Institute of Welding for 1959–60.

W. Barr, O.B.E., A.R.T.C., and E. Fuchs, M.A., A.M.I.Mech.E., are the two new vice-presidents elected this year.

Mr Seymour-Semper is a director of Hancock & Co. (Engineers) Ltd. Mr Barr is the chief metallurgist of Colvilles Ltd, and Mr Fuchs is welding engineer of the Alkali Division of ICI.

Lectures, Conferences, and Courses

ASTM-AIEE Symposium on High Voltage Cable Insulation

A Symposium on High Voltage Cable Insulation, sponsored jointly by the Insulated Conductor Committee of the American Institute of Electrical Engineers, and Committee D-27 on Electrical Insulating Liquids and Gases of the ASTM will be held on 18 November 1959, at the Governor Clinton Hotel in New York, in conjunction with meetings of the two sponsoring bodies.

The programme will be as follows: *Paper for High Voltage Cable*, W. A. Del Mar (consulting engineer, Habirshaw Cable and Wire Division, Phelps Dodge Copper Products Corp); *Why and How of Cable Oil Tests*, R. B. Blodgett (research director, The Okonite Company); and *The Public Utility View of Cable Oils*, A. M. Gates (senior engineer, Philadelphia Electric Co.) and R. W. Gillettee (senior engineer, Consolidated Edison of New York).

While the symposium is primarily for those attending the ASTM and AIEE meetings, the public is invited. There will be no registration for the symposium. Additional information may be obtained from V. R. Mulhall, Canadian General Electric Company, Peterborough Engineering Laboratory, Peterborough, Ontario, Canada.

Heating and Ventilation

The Eleventh Conference of the British Occupational Hygiene Society which will be held on 5 November 1959 will be devoted to a discussion of the problems of heating and ventilation as they affect personnel working in arduous environments. Among the speakers will be Dr T. Bedford, Medical Research Council, who will deal with the physiological aspects of heating and ventilation, and Dr A. R. Lind of the National Coal Board, who will discuss problems raised by work in hot environments. The conference is being held at the Institution of Mechanical Engineers, London.

Non-members are eligible to attend this conference on payment of a registration fee, and full details can be obtained from Dr D. Turner, the Associated Ethyl Company Ltd, Ellesmere Port, Cheshire.

European Market Integration

A three-day course on the theme of "The Six and the Seven" is being jointly organized by Britain in Europe and the Federal Trust for Education and Research. This will be held at the St Ermin's Hotel, London, S.W.1., on 28–30 October.

Speakers or chairmen who have accepted include:—Lord Salter, P.C., G.B.E., K.C.B., former Minister of State for Economic Affairs, etc.; Sir Cecil Weir, K.C.M.G., K.B.E., M.C., chairman of International Computors and Tabulators Ltd; Georges Berthoin, deputy chief representative in London of the Delegation of the High Authority of the European Coal and Steel Community; Lord Colyton, P.C., C.M.G., director of Metal Industries Ltd, etc.; Lt General Sir Thomas Hutton, K.C.I.E., C.B., M.C., former director of the British Productivity Council; Raymond Davidson, vice-president Hanover Bank; John Pinder, managing editor of the Economist Intelligence Unit Ltd; Rear-Admiral E. H. Shattock, C.B., C.B.E., Group Export Services Organization, Guest Keen & Nettlefolds Ltd; and W. E. K. Piercy, director of Albright and Wilson.

Books and Films

"Man and Raw Materials"

The ASTM has just published the Edgar Marburg Lecture "Man and Raw Materials", by Elmer Walter Pehrson, which was presented at the Society's 1958 Annual Meeting.

Mr Pehrson touches on the major political, economic, and technological factors affecting raw material availability; the geopolitical implications of raw material resources and production; and the problems confronting industrial nations in their access to raw material resources in the backward areas of the world. He discusses national and international raw material policies and the industrial and military power inherent in the resources and potential raw material strength of the Sino-Soviet block, as well as the contrast of the resource limitations on industrial growth in the United States and the U.S.S.R. The price is $1.25, and copies are obtainable from the ASTM, 1916 Race Street, Philadelphia 3, Pa.

Dechema Publications

Two new publications to be issued by DECHEMA, of Dechema-Haus, Frankfurt (Main), Rheingau-Allee 25, contain the texts of papers presented at meetings held within the framework of the European Congress of Chemical Engineering and the ACHEMA Congress 1958 in Frankfurt am Main.

Betreibstechnik-Grundlagen, which costs DM 48.80 (DM 39 to members of the DECHEMA), deals with the scientific principles of plant technology. In addition to a number of special problems, the subjects covered in particular detail include the technical control of reactions, heat and mass transfer, evaporation, drying, and liquid-liquid extraction.

The second publication, *Betreibstechnik-Verfahren und Operation*, is concerned with the course of chemical reactions and the stages preceding and following the main part of the processes. New methods for the production of hydrocyanic, acetic, and phosphoric acids, synthesis gas, and specially-purified manganese and silicon are described. Accounts are also given of progress in plant design for carrying out various processes such as distillation, evaporation, filtration, heat exchange, fluidized bed processes, and high-pressure electrolysis. The price is DM 37.50 (DM 30 to members of the DECHEMA).

Abstracts of the papers are given in English and French and include a subject index.

Oil Fires

The July issue of the *Fire Protection Association Journal*, which is mainly concerned with the Chicago School fire of last December, also contains a report on the fire at the Signal Hill, California, refinery, in May 1958.

The technical notes describe explosion hazards which occur in gas or oil heating if the fuel is not quickly ignited when starting up or if, after combustion has accidentally ceased, the flow of fuel continues or is restored after an interval. The provision of flame failure devices and fire valves designed to cut off the fuel if combustion ceases, is discussed in detail.

The *Journal*, which is obtainable from the Fire Protection Association, 31–45 Gresham Street, London, E.C.2, is price 4*s* to non-members.

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LABOUR STATISTICS FOR THE U.K. PETROLEUM REFINING INDUSTRY

The following figures are taken from the August 1959 issue of the *Ministry of Labour Gazette*.
(cf. previous figures given in the *IP Review* 1959, **13**, 103)
Figures in italics are the average for all the industries covered by the tables.

	Men (21 and over)	*Youths and Boys*	*Women (18 and over)*	*Girls*	*All Workers*
No. of workers covered by remuneration statistics ...	20,224	843	1265	19	22,351
Average earnings in last pay-week in April 1959 (shillings)	276/5 *262/11*	136/9 *114/–*	145/4 *137/–*	— *87/4*	263/6 *222/6*
Average number of hours worked in this pay-week ...	48·1 *48·0*	45·9 *44·6*	43·1 *41·5*	— *42·3*	47·7 *46·3*
Average hourly earnings in this pay-week (pence) ...	69·0 *65·7*	35·8 *30·7*	40·5 *39·6*	— *24·8*	66·3 *57·7*
			Males	*Females*	
Numbers employed (June 1959)			34,700	7400	42,100
Numbers unemployed (at 13 July 1959)			277	41	318

PIPELINE GUILD VISIT TO ROMFORD WORKS

On 14 July members of The Pipeline Industries Guild paid a visit to the Romford gas works as guests of the North Thames Gas Board.

The party was received by Dr J. Burns, chief engineer, L. J. Clark, development engineer, and other members of the Gas Board. A most instructive tour was first made of the works, where members were most impressed by the well-organized and controlled methods for producing town's gas from oil, methane, and refinery gas.

Following lunch the tour continued, covering various points of the 24-inch diameter pipeline route which will finally link up Beckton gas works with the Romford-Shell Haven and Canvey pipeline. A 6-inch diameter line was being laid alongside the 24-inch, and the party was able to observe set-up and welding of this at one point.

A vote of thanks to Dr Burns and the North Thames Gas Board for an excellent day's visit was given by Capt J. W. Esmonde, deputy chairman of the Guild.

★ ★ ★

Middle East Oil Production

	July	*Jan.-July*
	Tons	
Iraq Petroleum Co. Ltd	2,323,529	14,857,675
Basrah Petroleum Co. Ltd ...	946,329	7,030,118
Mosul Petroleum Co. Ltd ...	105,509	742,492
Qatar Petroleum Co. Ltd ...	662,938	4,623,788
Iraanse Aardolie Exploratie en Productie Mij	3,712,000	25,391,000
Kuwait Oil Co. Ltd	5,851,975	40,199,367
	Barrels	
Arabian American Oil Co. (Saudi Arabia)	32,943,375	227,290,381
Bahrain Petroleum Co. Ltd ...	1,395,072	9,570,065

The refinery throughput at Abadan of the Iraanse Aardolie Raffinage Mij for July was 1,363,000 tons, the total for 1 January to 31 July being 8,873,000 tons.

Crude processed at Aramco's Ras Tanura refinery during July was 4,858,820 brl, the total for 1 January to 31 July being 37,049,174 brl.

Oil deliveries from Sidon, Lebanon, by Trans-Arabian Pipeline Co. in July were 10,327,225 brl, the total for 1 January to 31 July being 75,314,014 brl.

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IP ECONOMICS AND OPERATIONS GROUP

This Group is open to all members of the Institute who wish to take part in discussions on petroleum economics, distribution, transport, and storage. The only formality necessary is to notify E. Herbert at the Institute's office.

The 1959–60 session opens on 12 November when V. Safronchook of the Soviet Embassy will be talking on "Soviet Energy Policy". Further meetings arranged by the Group are as follows:—

10 December ...	**Economics and Planning in the Steel Industry.** Sir Robert Shone (*Iron and Steel Board*).
1960	
14 January	**The Outlook for International Air Transport.** S. Wheatcroft (*Aviation Consultant, Economic Adviser to BEA*).
11 February ...	**Saharan Oil and Gas.** A speaker from the Direction des Carburants.
10 March	**The Future of the Electricity Industry.** L. O'Donnell (*The Electricity Council*).
7 April	**A Review of the Year.** D. F. Mitchell (*British Petroleum Co. Ltd*).

Trade Literature, etc.

Marketing of Specialized Hydrocarbon Solvents

With effect from 1 July 1959, Shell Chemical Company Ltd will be taking over the marketing of certain specialized hydrocarbon solvents from Shell-Mex and B.P. Ltd. The products involved are the aromatic solvents—*Octaro* and Reference X7, and the odourless aliphatic solvent *Shellsol*.

Shell-Mex and B.P. Ltd will continue to supply the hydrocarbon solvents—white spirits, distillate, special boiling point spirits, and rubber solvent.

George Angus Hoses

George Angus & Co. Ltd, Angus House, 152–158 Westgate Road, Newcastle-upon-Tyne 1, have produced a new catalogue giving details, not previously publicized, of their range of oil suction and discharge hose qualities, complete with full technical data.

Fluid Hose Coupling

Alfred Bullows & Sons Ltd, Long Street, Walsall, announces the introduction of a new quick release fluid hose coupling, manufactured under licence from the Binks Manufacturing Company of America.

This new Bullows quick-release fluid hose coupling is playing a vital part on the production line where a wide range of colours is in use. It enables the operator to make a rapid change of colours and secondly, the gun can be disconnected for cleaning purposes without the necessity of "blowing back" or cleaning out fluid lines.

Hilger & Watts Instruments

Recent news releases from Hilger & Watts Ltd, 98 St Pancras Way, Camden Road, London, N.W.1, give details, first of the Company's atomic-absorption spectroscopy equipment, which is particularly designed for use with the Hilger Uvispek spectrophotometer. A second report describes the Hilger continuous-flow refractometer which makes a continuous comparison between a reference liquid and a flowing sample, and is particularly suited for continuous monitoring in process control systems.

The Company further announces that D. G. Heywood, 21 Kirkstall Road, Sheffield 11, has been appointed their representative for Yorkshire, Lancashire, Cheshire, and North Lincolnshire.

New Helicopter Rig

A new rig has been devised by The National Supply Company which overcomes the transportation barriers which formerly prevented exploration and development in remote or inaccessible areas.

The new Type 4—10 Helicopter Rig makes drilling in such regions practicable and economic, and can operate to a depth of 10,000 feet. Precise sectionalizing of the rig permits disassembling into components weighing less than 4000 lb each. These components are sufficiently light for transportation by helicopter, cargo plane, track-type vehicle, or light boat and barge.

A bulletin giving a comprehensive description of the new rig is obtainable from The National Supply Co., 2 Gateway Centre, Pittsburgh 30, Pennsylvania.

New Transistorized Portable Seismic System

Southwestern Industrial Electronics Co. (SIE), a division of Dresser Industries Inc, announces the introduction of its new PMR-20 Portable FM magnetic recording system, a 24-channel transistorized system complete in two compact, lightweight units. It provides high-fidelity frequency modulated recordings on standard SIE magnetic tapes from the output of standard geophysical amplifiers.

The recording provides an exceptionally high signal-to-noise ratio (60 db, rms) and wide frequency response (1-500 cps), assuring maximum reproduction flexibility and eliminating effects of tape imperfections and irregularities. The low noise level, low distortion (less than 1 per cent), high timing-accuracy (0·2 ms ± 1 ms) characteristics are combined with additional features to produce a portable, low power-drain (12 vdc, 7 amp), lightweight system.

U.K. Pipe-Handling Tractor for Nigeria

A pipe-handling tractor, the first of its kind to be made in the U.K., is now on its way to Port Harcourt, Nigeria, for oilfield use in the Niger Delta.

Ordered by Shell International Petroleum Company Ltd. from Michigan (Great Britain) Ltd. of Camberley, Surrey, the machine, known as the *Michigan* 175A Pipe Handler, will be used to speed up operations in the materials yard, at pipeline construction jobs, and drilling locations. It is designed to lift a load of 14,000 lb of tubulars in lengths up to 40 feet and travel with them as required, and will load and unload a 50,000 lb pipe-carrying trailer and tow it at speeds of up to 27 mph, depending on the terrain.

The pipe-handling forks are designed to tilt forward at 72 deg. under hydraulic control, which enables pipe to be picked up from a point 3 feet below ground level—a valuable feature when barges have to be loaded or unloaded.

Radio-Activity Protection Service

With the increasing use of radio-active materials in industry, workers must be protected by ensuring that the level of radiation is kept within safe limits.

Elliott Nucleonics Ltd, 34 Portland Place, London, W.1., a member of the Elliott-Automation Group, has now inaugurated a new advisory and supply service for installed health monitoring equipment for areas where radio-active materials are used. The engineers of the Company have been engaged for a number of years on developing nuclear and health monitoring instruments for the U.K. Atomic Energy Authority.

Tecalemit Expansion in Oil Firing

Tecalemit Ltd, Plymouth, has bought all the shares in Industrial & Domestic Heaters Ltd, which manufactures and sells the well-known "Selectos" system.

Tecalemit Ltd has also purchased a majority interest in British Oil Burners Ltd, combustion engineers largely engaged in the installation of "Selectos" burners.

The acquisition of these two businesses represents a widening of Tecalemit's interest in the oil firing business.

Philips Cold Box Installation

Research and Control Instruments Ltd, Instrument House, 207 King's Cross Road, London, W.C.1, sole distributors of Philips scientific equipment in the U.K., announce the introduction of the Philips cold box installation, cooled at any preset temperature by the circulation of cold gaseous air. This is believed to be the first of its kind in the world with a net content of about 400 litres for temperatures down to minus 160°C. Refrigerating capacity at minus 100°C is 4-400 Btu/hr, and 2560 Btu/hr at minus 160°C.

Heavy Vehicles Break New Ground

Four Perkins-engined Seddon seven-ton trucks recently accomplished a new feat for heavy vehicles in South Africa.

F. Perkins (South Africa) (Pty) Ltd. successfully arranged for the Seddon trucks, powered by R6 Mk2 diesel engines, developing 102 bhp at 2400 rev/min to make a 12-hour journey to the Kau diamond mines, 9000 feet up in the Basutoland mountains. It was previously thought that helicopters and four-wheel drive, Jeep-type, vehicles were the only transport capable of reaching the mines.

Rust Inhibitors

A booklet describing the use of Geigy rust inhibitors to protect metal surfaces against corrosion, has been issued by The Geigy Co. Ltd, Rhodes, Middleton, Manchester.

The inhibitors described are of two kinds: one based on derivatives of N-methyl glycine, and known as *Sarkosyls*, and the other represented by the compound *Amine O*, which is a substituted imidazoline.

Ministers Visit Flexibox Factory in Ireland

The Northern Ireland Government Minister of Commerce, Lord Glentoran, and Minister of Finance, Capt. T. O'Neill, were among a party of officials, industrialists, technicians, and civic dignitaries who visited the Ballymena, Northern Ireland, factory of Flexibox Ltd on 3 July. The guests were welcomed by the chairman of the Company, Major-General L. O. Lyne, and the managing director, F. B. Porges.

Manufacture of mechanical seals for pumps, agitators, compressors, mixers, and other rotary shaft equipment first commenced at Ballymena in January 1957.

A number of examples of equipment fitted with Flexibox mechanical seals were displayed, including oil refinery pumps, chemical works pumps, and food-handling equipment. Seals of the type fitted to tanker cargo pumps, aircraft fuel pumps, superchargers and helicopter mechanisms, automobile coolant pumps, nuclear and conventional power station pumps, and refrigeration compressors were available for inspection.

Amber Chemical Industries

A reciprocal trading arrangement has been made between Amber Chemical Industries Ltd, 11a Albemarle Street, London, S.W.1, and the D. A. Stuart Oil Co. Ltd, of Chicago and Detroit (in association with Canadian D. A. Stuart).

Amber Chemical Industries Ltd is appointed sole distributor and licensee in the U.K., Eire, South Africa, Australia, and New Zealand for all the products of D. A. Stuart. These products include *ThredKut*, *SuperKool*, and *Dascolene* Cutting Oil bases and grinding oils; *Dasco* soluble oils, bases, and hydraulic fluids; and *Dasco* and *Sturaco* lubricating oils, greases, and bases.

Infra-Red Spectrophotometer

A new booklet that has been received from Hilger & Watts Ltd, 98 St Pancras Way, London, N.W.1, describes the *Hilger H800* recording infra-red spectrophotometer. Twenty highly-informative pages give the reader a detailed account of the instrument, describing its applications, how it works, and its various component units. These are supplemented by photographs and demonstration charts and a list of the relevant specifications.

Castrol in New Zealand

The branch of the Wakefield group of companies in New Zealand—C. C. Wakefield & Co. Ltd, Corner Dixon & Willis Street, Wellington—has now assumed full branch status with direct responsibility to headquarters in London.

Terratired Vehicles for Colombian Swamps

First of their kind to be made in the U.K., a fleet of 6 high-floatation Terratired oilfield vehicles (one of which is shown in the accompanying photograph) have been ordered for use by Shell Condor SA in the Llanos region in Colombia, carrying heavy equipment in territory hitherto only approachable by helicopter or special costly tracked vehicles.

The machines are standard Bedford 4 x 4 cross-country trucks adapted to the design of Shell engineers and modified by All Wheel Drive Ltd of Camberley. The large Terratires, which are very much wider and contain a far greater volume of air than normal tyres, allow for ground-bearing pressure of less than the 6·5 psi exerted by a man. The Terratires are 40 inches in diameter, the front tyres being 18 inches, and the rear tyres 24 inches wide.

In their solo form, the trucks are designed to carry a load of 4000 lb in swampy areas. In conjunction with special Dyson pipe trailers they can transport 10,000 lb of line pipe.

An outstanding feature is their ability to traverse soft ground at 20 mph, a speed impossible with heavy tracked vehicles.

MS7 Mass Spectrometer

Metropolitan-Vickers Electrical Co. Ltd, Trafford Park, Manchester 17, has just completed the first production model of the MS7 Mass Spectrometer. The instruments now being produced are for the National Physical Laboratory, the Services Electronics Research Laboratory, the Mond-Nickel Company, and the UKAEA.

The MS7 Mass Spectrometer has been designed specifically for the purpose of measuring minute impurities in solid substances using the spark ionization technique. Some of the materials which have been successfully analysed down to 0·01 ppm with the prototype model include uranium, tungsten, iron, copper, aluminium, tin, and nickel-chromium alloys.

The method is particularly useful for giving a general picture of the impurities in a solid. The whole mass range from 7-240, covering all elements, can be recorded in a single exposure of the photographic plate. Compared with emission spectroscopy the spectra are simpler and the elements easier to identify. Moreover, qualitative and semi-quantitative analyses can be carried out without extensive calibration.

Extensions to Teesport Installation

Shell-Mex and B.P. Ltd has begun major extensions to its ocean oil installation at Teesport on the south bank of the River Tees, which should be completed by the autumn of 1960. These, when complete, will bring the total cost of the installation to nearly one million pounds, and will practically double its storage capacity. The extensions entail the construction of a large number of additional tanks, some of nearly 12,000 tons capacity. An extra four miles of pipeline will also be laid down, together with a new pumphouse and boilerhouse. The Teesport installation was originally opened as recently as September 1957.

New Airborne Geophysical Instrument

Hunting Geophysics Ltd is to undertake an extensive research and testing programme with the new Mullard electromagnetic detector installed in a Scottish Aviation Twin Pioneer. The testing programme is being carried out at the request of the Rio Tinto Company who are owners of the aircraft and for whom the equipment was developed.

The Mullard unit is designed to detect ore bodies lying at or beneath the earth's surface. It is capable of distinguishing between potentially valuable deposits and poor conductors such as swamp and saline overburden.

Cockburns Agreement for U.S. Valves

Cockburns Ltd, Cardonald, Glasgow, have concluded an agreement with Black, Sivalls & Bryson, Inc, Kansas City, U.S.A., to manufacture under licence their Super 70 series of control valves and associated equipment.

The full range of these valves and controls will be manufactured in Glasgow and by their subsidiary, Cockburns (Nederland) NV, at Schiedam.

Cockburns are now completing a contract valued at approximately £20,000 for Super 70 series valves for installation at the Hassi Messaoud oilfield in the French Sahara.

Shell-BP Products for Nuclear Power Station

Shell-Mex and B.P. Ltd are to supply all the petroleum products necessary to the building of the 500,000 kW nuclear power station at Trawsfynnydd, North Wales.

Contracts worth £262,000 have been signed with Nuclear Civil Constructors (Trollope and Colls Ltd, and Holland and Hannen and Cubitts Ltd) for the supply during the 4½ years building programme, when nearly 3,500,000 gallons of petroleum products will be delivered, most of it from the Shell-Mex and B.P. sea-fed supply depot at Caernarvon.

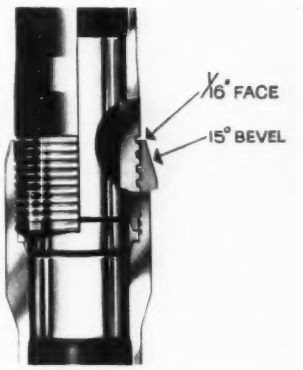
Metal Deck Roofing for 19th-Century Fort

Popton Fort, originally constructed as part of the defence fortifications of Milford Haven, and soon to begin a fresh lease of life as the administrative offices for The British Petroleum Co.'s new deep-water tanker terminal at Angle Bay on the south side of the Haven, has been provided with a new roof of Ruberoid metal deck.

A Ruberoid insulated metal deck roof was selected to cover the 2760 sq yd roofing area because of its lightness of structure over long spans and the low bearing load it imposes upon the existing structure.

New Tubing Design

The accompanying illustration shows a design change in Jones & Laughlin Steel Corporation's Grayloc Tubing, designed for use in high-pressure oil and gas wells. The circled area magnifies the 1/16-inch bearing face and 15° bevel that prevents hang-up of the tubing going into or coming out of multiple completion wells. Further details should be obtained from the company, at 3 Gateway Centre, Pittsburgh 30, Pennsylvania.



"Oilfield Equipment 1959"

The booklet of this title presents an informative catalogue of some of the wide range of oilfield equipment manufactured by The Oil Well Engineering Co. Ltd, at Cheadle Heath, Stockport, Cheshire. The items are all identical to, and completely interchangeable with, equipment made by several leading U.S. companies.

The publication features details and specifications of many types of drilling equipment, including drawworks, slush pumps, rotary swivels, blocks, rotary machines, and drill pipe, and in addition, tank car and tank truck loading arms.

Shell-Mex and B.P. Superfueller Ready for Service

The 10,000-gallons 50-ton "Severn" superfueller designed for Shell-Mex and B.P. Ltd and seen at the recent Society of British Aircraft Constructors' show at Farnborough this year is the first of five superfuellers on order for the Company's aircraft fuelling service at London Airport.

The superfueller is rated to deliver fuel at 750 gallons a minute. It is 50 x 8 x 11 feet, is articulated, and has a tank of magnesium aluminium alloy.

The AEC Mammoth Major Mark 3 tractor unit houses the main cargo pump, fine particle filters, meters, hoses, and pressure control equipment. The tank was constructed by A.S.T. Ltd, Hamble. Zwicky Ltd of Slough built the pumping equipment and filters.

New Anti-Freezes

Two new brands of anti-freeze being marketed by Shell-Mex and B.P. Ltd in the 1959–1960 season incorporate new and highly effective additives to prevent corrosion and to increase the resistance of engine coolants to foaming.

The new products are *Shell Anti-Freeze* and *BP Anti-Frost*, which replace *Snowflake Anti-Freeze*, now withdrawn from the market.

Both are based on a formula developed by the Chemical Research Laboratory of the DSIR and they also comply with the provisional BS Specification CY(FHC)5100, type "B", the final form of which is to be issued shortly.

They are equally suitable for petrol and diesel engines.

Tank-Buoy System for Offshore Oil Discharging and Bunkering

A new system for connecting off-shore tankers with tanks, water supplies, etc, on land, has been evolved by a Swedish consortium, AB International Marine and Oil Development Corporation, Stockholm. The system is based on the use of a buoy, called the Imodco Buoy, connected with the land by pipeline, which has been tested with good results by the Swedish Navy.

The first buoy was built at the Helsingborgs shipyard and designed for use by vessels of 2000 tons. But the largest size should in the future be able to serve vessels of 100,000 tons. It can also be used for discharging spill-oil and is adaptable for certain types of cargo in solid form.

The inventors claim that there should also be great possibilities of using the buoy when tapping new oilfields before adequate harbours have been built. Normally, the ship's own pumping installation ought to be able to handle the unloading or loading, but in the other cases pumping stations on land, or the utilization of existing height of fall, might be resorted to.

Forthcoming Meetings

THE INSTITUTE
(At 61 New Cavendish Street, London, W.1, 5.30 p.m.—tea 5 p.m.)
Oil and Transport. W. S. Ault, B.A. **4 November**

IP ESSEX BRANCH
(At Railway Hotel, Pitsea, 7.30 p.m.)
Liquid Fuels for Rocket Propulsion. E. M. Goodger. **10 November**

IP FAWLEY BRANCH
(At Esso (Fawley) Recreation Club, Holbury, 7.30 p.m.)
Development at Wilton. G. M. Power, B.Sc., A.R.I.C., A.M.I. Chem.E. **11 November**
(At the Montagu Arms Hotel)
Dinner-Dance **20 November**

IP LONDON BRANCH
(At 61 New Cavendish Street, London, W.1, 6 p.m.—tea 5.30 p.m.)
Films in the Oil Industry. R. F. Leach, M.A. **18 November**
Film Evenings at Shell-Mex House. **4 and 11 December**

IP NORTHERN BRANCH
(At Engineers' Club, Albert Square, Manchester 2, 6.30 p.m.)
Standard Methods. W. Pohl. **17 November**
(At Warner's Theatre and Old Nag's Head Hotel, 5.30 p.m.)
Film Show and Hot Pot Supper. **8 December**

IP SCOTTISH BRANCH
(At BP Refinery Recreation Hall, Grangemouth, 7.30 p.m.)
Gas Turbines and their Fuels. Dr. W. Rizk **19 November**

IP SOUTH EASTERN BRANCH
(At the King's Head Hotel, Rochester, 7.45 p.m.)
Automation in the Office. G. C. May **3 November**
(At the Tudor House, Bearsted)
Annual Ball **13 November**

IP SOUTH WALES BRANCH
(At the Training Centre, BP Refinery (Llandarcy) Ltd, 5.30 p.m.)
Looking Ahead. On the Threshold of our Second Century. H. E. Snow, C.B.E. **28 October**
Oil Additives—Technical and Economic Aspects. E. R. Palmer, B.Sc., M.A.S.E. **12 November**

IP STANLOW BRANCH
(At Blossoms Hotel, Chester, 7.30 p.m.)
An Introduction to the Free Piston Engine. R. M. Hosie, A.R.C.S.T., A.M.I.N.A., and K. A. Troth, G.I.Mech.E. **18 November**

IP YORKSHIRE BRANCH
(At Prospect Hall, Cleckheaton, 7.30 p.m.)
Annual Dinner **18 November**
(At Hotel Metropole, Leeds, 7 p.m.)
Lubricating Oils—Their Origin and Properties. R. Deval. **9 December**

IP ECONOMICS AND OPERATIONS GROUP
(At 61 New Cavendish Street, London, W.1, 5.30 p.m.—tea 5 p.m.)
Soviet Energy Policy. V. Safronchook *(Soviet Embassy)* **12 November**

* * *

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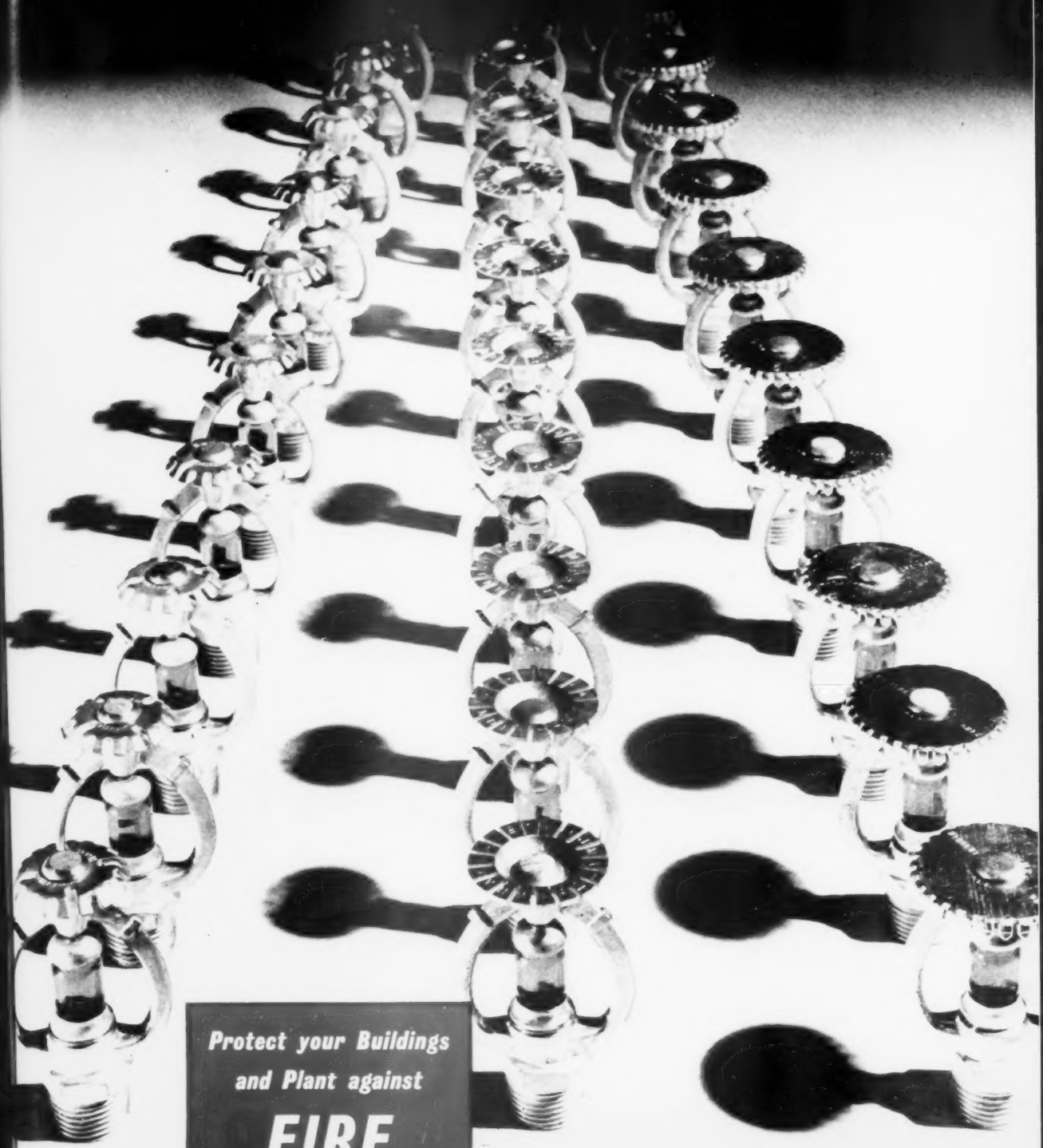

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Vol. C. Reduction of Observed Specific Gravity and Volume to 60°F. For LPG and Casinghead Gasoline	5 0	Vol. I. Reduction of Observed Density and Volume to 15°C. For LPG and Casinghead Gasoline	6 0
Vol. D. For Aviation Gasoline, Motor Gasoline, Kerosine and Gas Oil	6 0	Vol. J. For Aviation Gasoline, Motor Gasoline, Kerosine and Gas Oil	6 6
Vol. E. For Diesel Fuel and Fuel Oils ...	6 6	Vol. K. For Diesel Fuel and Fuel Oils ...	7 6
Vol F. For Fuel Oils and Bitumen ...	6 6	Vol. L. For Fuel Oils and Bitumen	7 6

British Tables A—G; Metric Tables H—L

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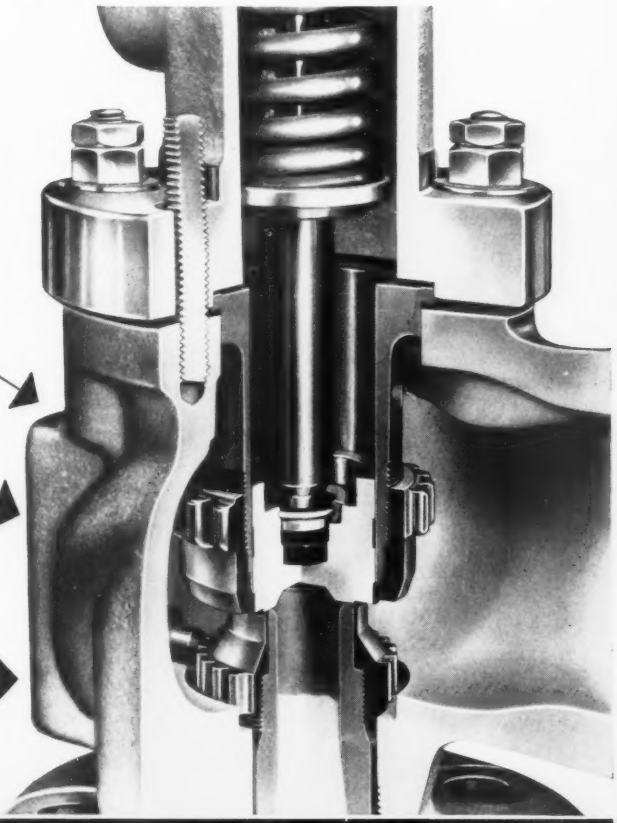

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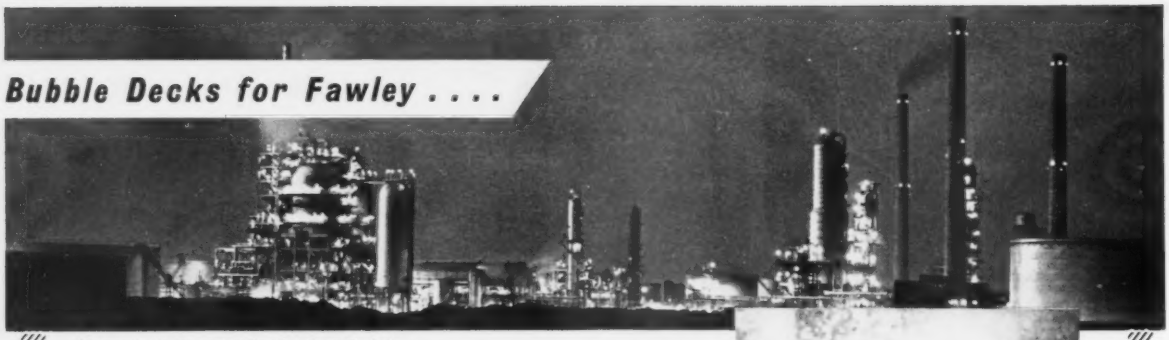

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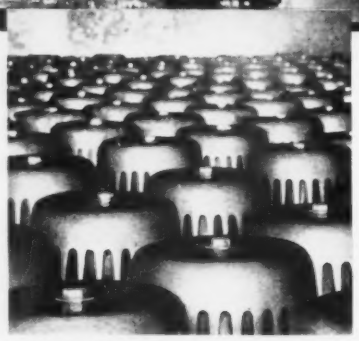

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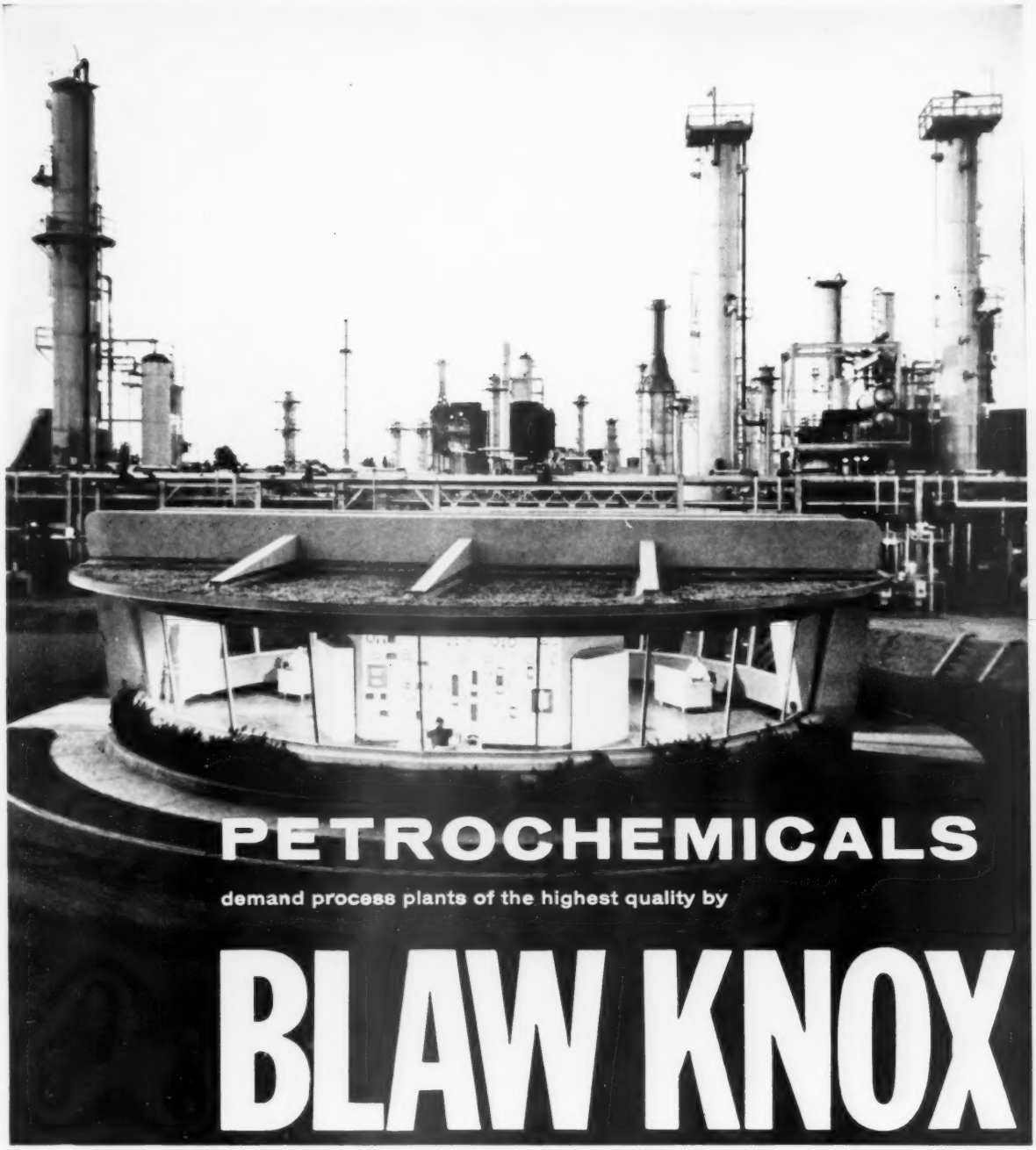

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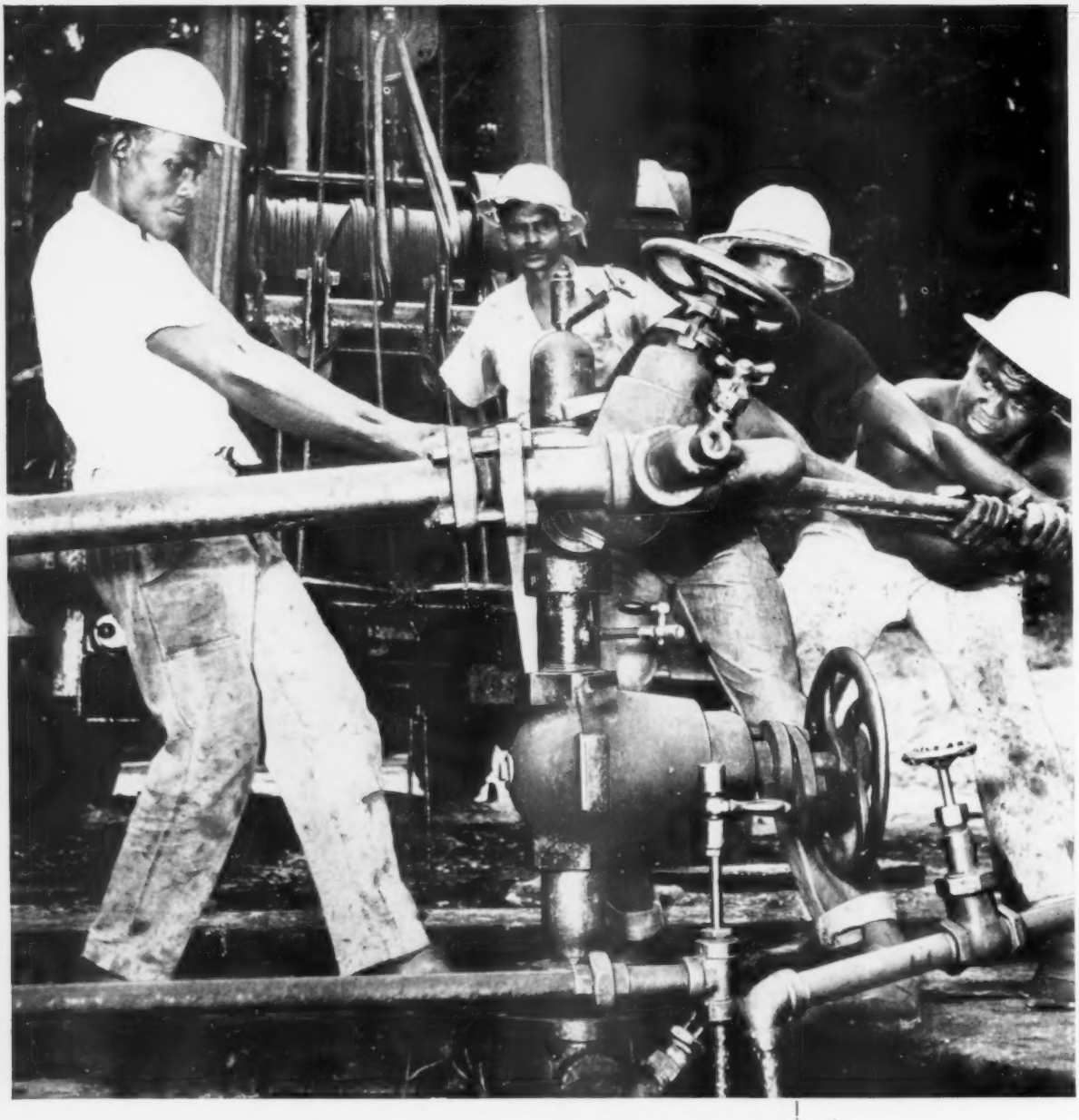

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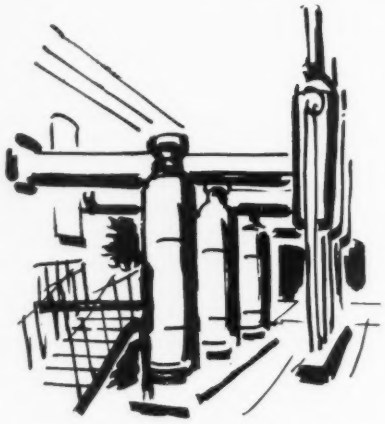

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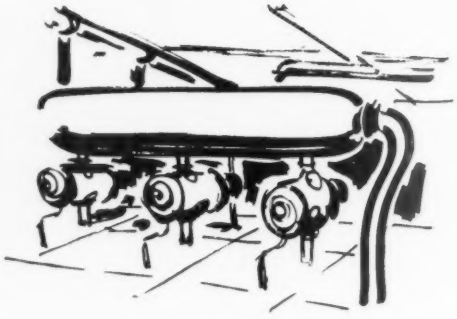

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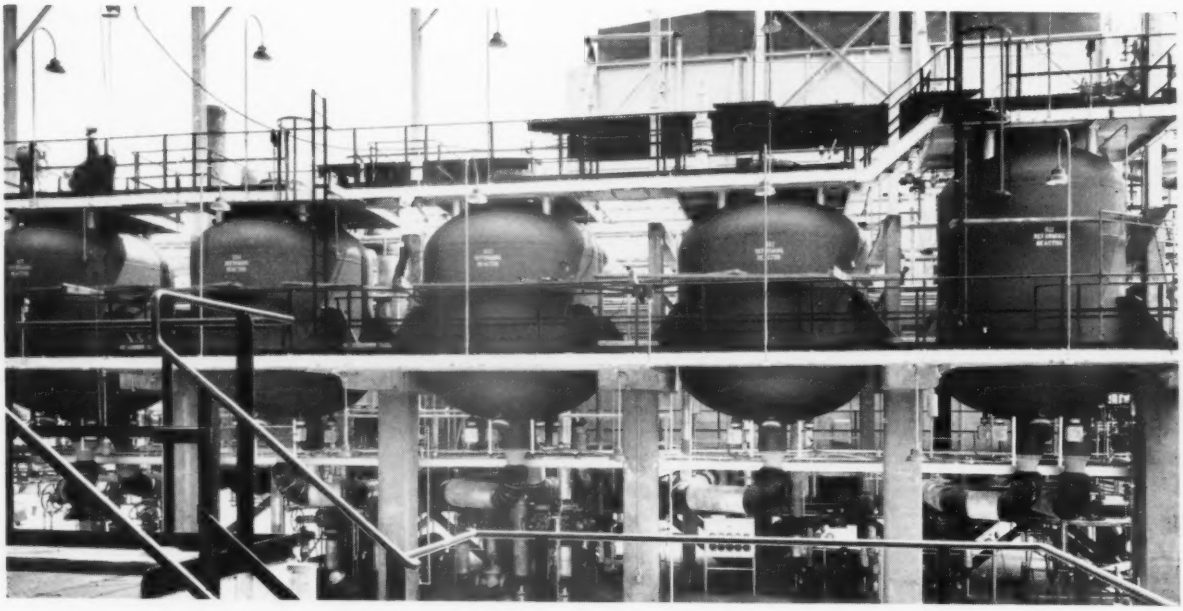

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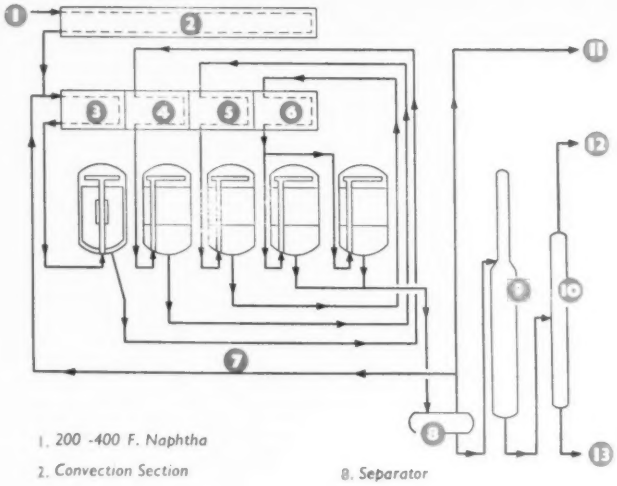

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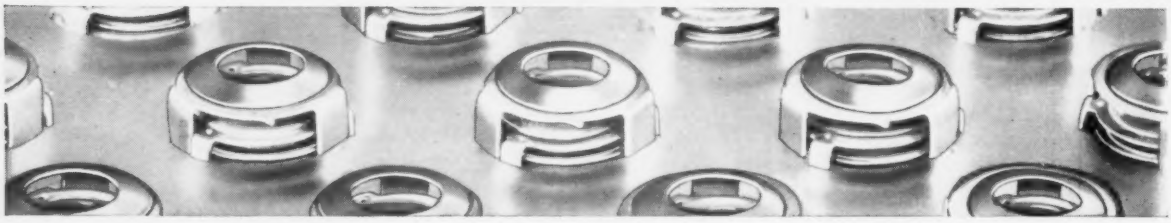

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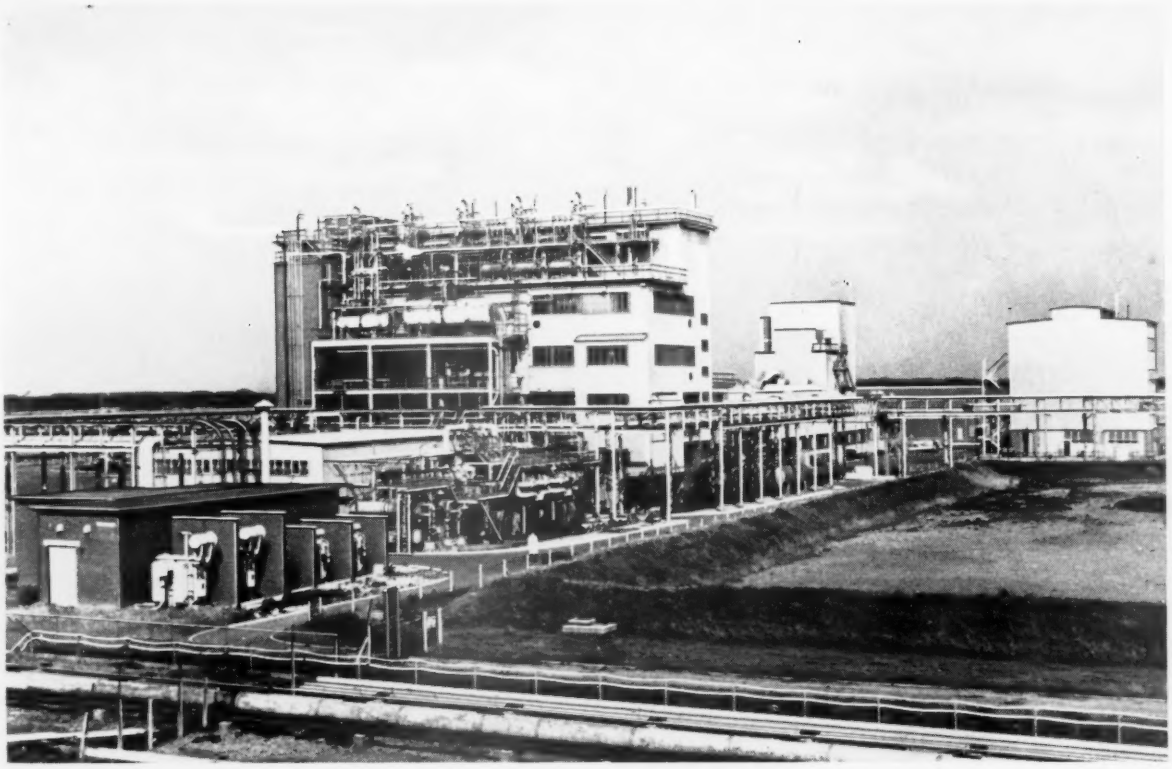

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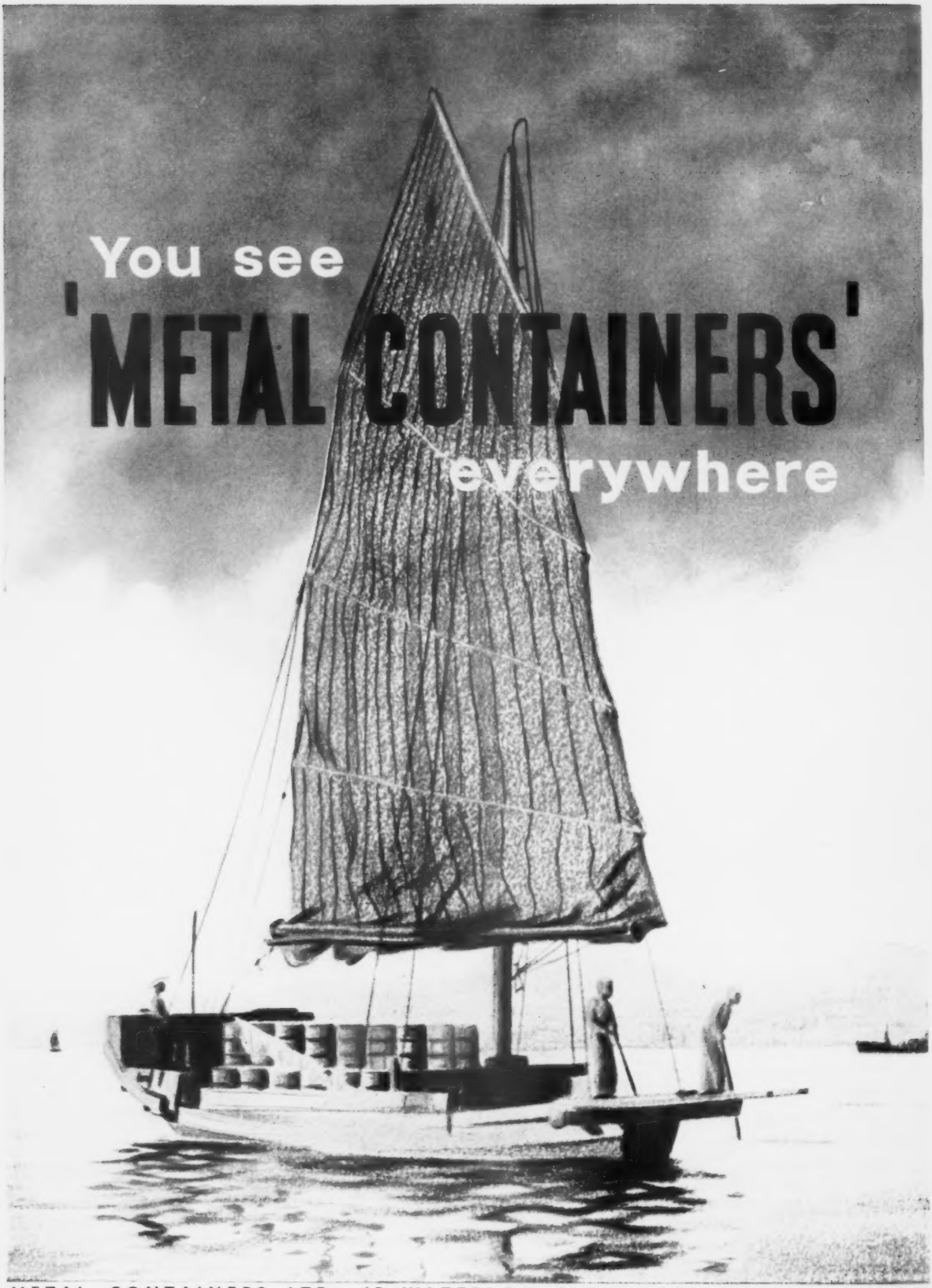

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